Botley West Solar Farm

Non-Technical Summary

30 November 2023

Approval for issue	
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Glossary

Term	Meaning
The Project	The Botley West Solar Farm (Botley West) Project
PA 08	Planning Act 2008

Abbreviations

Acronym	Meaning
CDC	Cherwell District Council
CTMP	Construction Traffic Management Plan
DCO	Development Consent Order
DESNZ	Department of Energy Security and Net Zero
EIA	Environmental Impact Assessment
ES	Environmental Statement
GHG	Greenhouse Gas
HDD	Horizontal Directional Drilling
HGV	Heavy Goods Vehicle
INNS	Invasive Non-Native Species
NGET	National Grid Electricity Transmission
NSIP	Nationally Significant Infrastructure Project
NTS	Non-Technical Summary
OCC	Oxfordshire County Council
PEIR	Preliminary Environmental Information Report
PINS	The Planning Inspectorate
PV	Photovoltaic
PVDP	Photovolt Development Partners GmbH
SoCC	Statement of Community Consultation
SPV	Special Purpose Vehicle
VWHDC	Vale of White Horse District Council
WODC	West Oxfordshire District Council

Units

Unit	Description
ha	Hectares
km^2	Square kilometres
MWe	Megawatts electric – electric output capability of the Project

1 Introduction

1.1 Purpose of this Non-Technical Summary

1.1.1 This Non-Technical Summary provides an overview of the Preliminary Environmental Information Report (PEIR) prepared for the Botley West Solar Farm. The PEIR has been prepared by RPS for Photovolt Development Partners GmbH (PVDP) on behalf of the Applicant, SolarFive Ltd. (SolarFive). SolarFive is a licence holder under the Electricity Act 1989 and also a registered company in England and Wales (company no. 12602740).

1.1.2 This Non-Technical Summary forms part of the documents submitted by the Applicant in support of the application for development consent for the Botley West Solar Farm (*hereafter referred to as 'the Project'*) and has been written in a non-technical language and summarises the information contained within the PEIR.

1.1.3 The purpose of PEIR is to present the preliminary findings of the Environmental Impact Assessment (EIA) being undertaken for the Project, for the purposes of statutory consultation in accordance with Sections 42 and 47 of the Planning Act 2008 (PA 08). PA 08 was introduced to provide a new development consent regime for 'Nationally Significant Infrastructure Projects' (NSIP).

1.1.4 The Project is classed as a NSIP for the purposes of PA 08 and requires an application for a Development Consent Order (DCO). The Applicant therefore intends to submit an application for development consent to the Secretary of State via the Planning Inspectorate (PINS), as required under PA 08.

1.1.5 The PEIR has been published as part of the consultation process, which also includes a series of community consultation events in accordance with the process set out in the Statement of Community Consultation (SoCC).

1.1.6 For access to the full PEIR, please refer to the National Infrastructure Planning Website: Botley West Solar Farm. Details of how to view the full PEIR and its volumes, or to obtain further copies of this NTS, are provided at the end of this document.

1.2 Overview of the Project

1.2.1 The UK Government has legislated to commit the country to achieving net zero carbon emissions by 2050, and to de-carbonising electricity by 2035. The Government's 'British Energy Security Strategy' (April 2022) also expects a five-fold increase in solar power generation, to 70GW, by 2035. These commitments mean that the UK urgently needs more renewable forms of electricity to be produced. The Project's generation output will be vitally important if the Government's commitments are to succeed, significantly helping to deliver the transition to net zero.

1.2.2 The Project is formed of three separate but related solar farm areas with interconnecting cables, which together would generate renewable power through photovoltaic (PV) panels. The Project aims to deliver approximately 840MWe of power to the National Electricity Transmission System (NETS),

providing secure and clean energy of an equivalent level to meet the needs of approximately 330,000 homes.

1.2.3 The Project's solar arrays (comprising all the mounting structures, frames and foundations) will be connected by underground electrical cables within each section of the site, and via underground electric cable to the substation at the grid connection point. The interconnecting cable route will largely follow the public highway, but some parts will cross land controlled by the Applicant.

1.3 Site Location

1.3.1 The Project lies within the administrative areas of Cherwell District Council (CDC), West Oxfordshire District Council (WODC), Vale of White Horse District Council (VWHDC) and Oxfordshire County Council (OCC).

1.3.2 The Project will be located in the county of Oxfordshire, across an area of approximately 1,300 ha. The Project location extends from an area of land in the north (the Northern Site), situated between the A4260 and the Dorn River Valley near Tackley and Wootton, through a central section (the Central Site), situated broadly between Bladon and Cassington, and connecting to a section further south near to Farmoor Reservoir and north of Cumnor (the Southern Site), where the Project will connect to the National Grid transmission network.

1.3.3 The majority of the Project lies within West Oxfordshire and within the Oxford Green Belt, with the majority of the land proposed for the Project currently used for arable crops or otherwise down to pasture. Details of the Project and its components have been provided in Section 5: Project Description of this document and the location of the Project is shown in Figure 1 Site Location Plan.

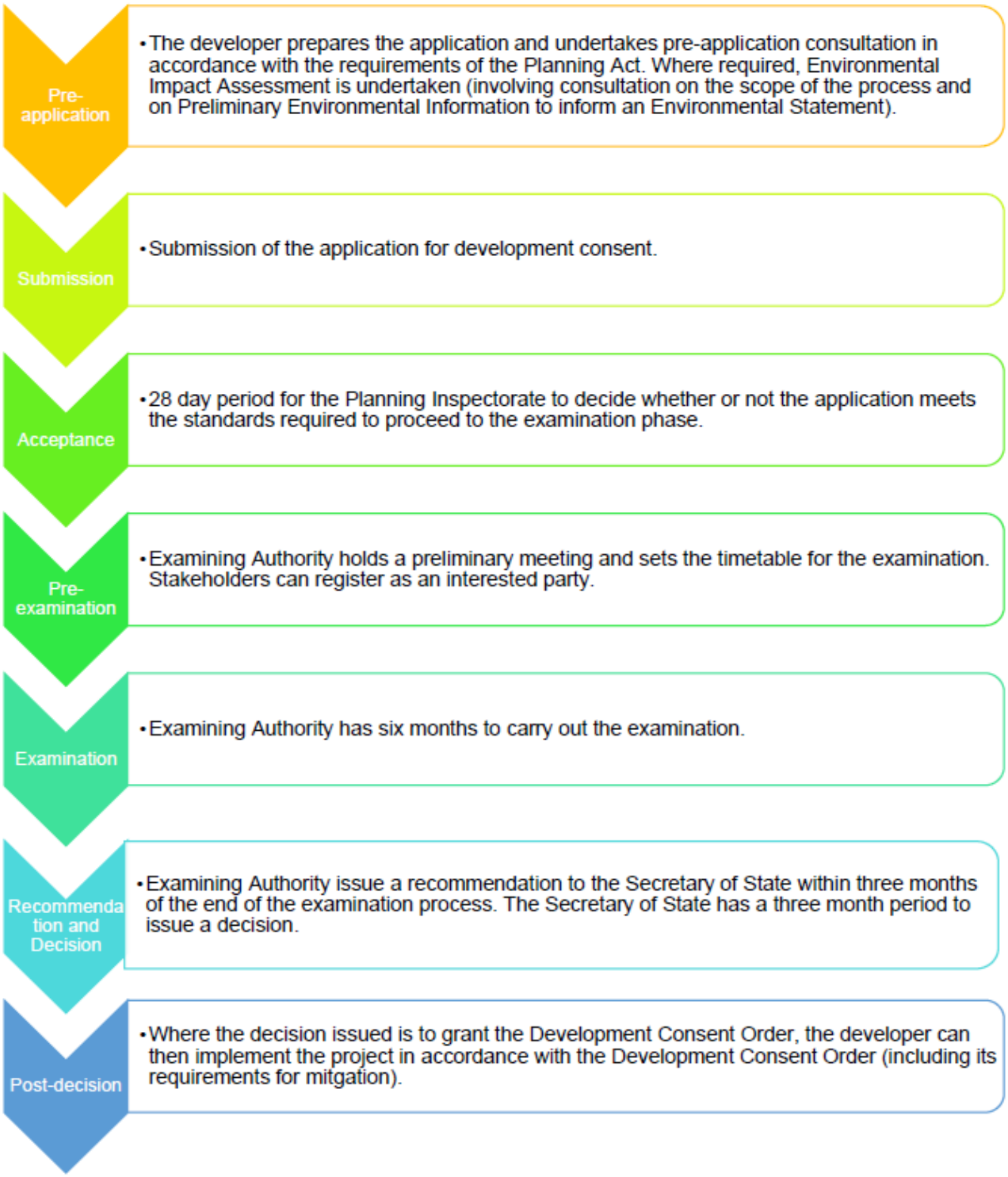
1.4 Consenting Process

1.4.1 The PA08 created a new development consent regime for major infrastructure projects in the fields of energy, transport, water, wastewater, and waste. The intention was to speed up the process for approving major infrastructure projects categorised as Nationally Significant Infrastructure Projects.

1.4.2 The Planning Inspectorate is a government agency responsible for dealing with applications for development consent for Nationally Significant Infrastructure Projects in England and Wales. The application for development consent for the Project is then ultimately decided by the Secretary of State.

1.4.3 PA08 defines the key stages in the application process for Nationally Significant Infrastructure Projects. These stages are summarised below in Diagram 1.4.1. The Project is currently at the pre-application stage.

Diagram 1.4.2: Overview of the PA08 Application Process.



2 Approach to Environmental Impact Assessment

2.1 What is the Environmental Impact Assessment (EIA)

2.1.1 EIA is the formal process of identifying and assessing the positive (beneficial) and negative (adverse) effects of a proposed development on the environment and determining if these are likely to be significant. Where significant adverse impacts are identified, suitable measures are proposed to avoid, prevent, reduce, or offset their effect on the environment. The EIA is then reported in an Environmental Statement (ES) to assist with the decision making process.

2.1.2 The PEIR presents preliminary findings of the environmental assessments undertaken to date. It does not represent a final project design, or include a full environmental assessment, with proposed conclusions and mitigation.

2.2 Consultation and Engagement

2.2.1 Consultation and engagement with stakeholders have formed an integral part in the development of the Project and the EIA process. The following consultation and engagement activities have been undertaken for the Project:

- **Public Consultation (September 2022 onwards)**: The Applicant undertook early engagement about the Project with the host authorities (CDC, WODC, VWHDC and OCC), political leaders and statutory consultees from September 2022 onwards, including holding a webinar for elected members prior to the start of the first stage of community consultation. Subsequently, the initial non-statutory community consultation was undertaken between Thursday 3 November 2022 and Thursday 22 December 2022, including with Parish Councils and key stakeholder groups. This initial consultation period had series of events.
- **EIA Scoping**: In order to inform the scope of the EIA, the Applicant sought a Scoping Opinion from PINS (on behalf of the Secretary of State) on 15 June 2023. The Scoping Opinion was subsequently received on 24 July 2023 and is reflected in the format and contents of this preliminary assessment report.
- **Public Consultation (Autumn 2023)**: This PEIR will be consulted on as part of the second (statutory) phase of public consultation. Following consultation, all comments on the PEIR will be taken into account, and potential changes to the Project will be reviewed and considered as a result of the comments received, in preparation of the ES that will accompany the application to PINS for development consent.

2.2.2 In addition to the formal consultation activities identified above, statutory bodies have also been consulted throughout the EIA process for some environmental topics such as landscape and visual, cultural heritage etc.

2.3 Scope of the Assessment

2.3.1 As set out above Scoping Opinion from PINS was sought by submitting the EIA Scoping Report on 15 June 2023. The EIA Scoping Report set out the scope and methodology of the EIA for the Project and was consulted upon by

the Planning Inspectorate and feedback was received from relevant stakeholders.

2.3.2 Following consultation, the Planning Inspectorate provided its Scoping Opinion on 24 July 2023. The Scoping Opinion formed the basis of the EIA for the Project by identifying and confirming which environmental topics require assessment in the Environmental Statement. The scope of the EIA will also be informed by relevant legislative requirements; the nature, size and location of the Project; and ongoing consultation responses received to date.

2.4 EIA Methodology and Approach to ES

2.4.1 For each environmental topic considered as part of the EIA process, the following information has been provided in the PEIR:

- introduction;
- legislation, guidance and policy considered;
- consultation and engagement carried out and how stakeholder feedback has been considered;
- a description of the existing or baseline environment;
- key parameters for assessment;
- identification of mitigation measures adopted as part of the Project (where required);
- impact assessment methodology; and
- identification and assessment of the likely significant effects.

2.4.2 The PEIR has also considered the potential for cumulative effects between the Project and other proposed developments. Cumulative effects are those which occur on the environment as result of the interaction between the Project and other proposed developments, where the effect is greater than if the Project was considered in isolation. For example, the cumulative effect on visual amenity during construction of the Project and another nearby development(s) on a local park or on a public footpath. Most environmental topics have considered the potential for cumulative effects except for few topics that will provide their assessments in the ES e.g. Traffic and Transport, Waste and Socio Economics.

2.4.3 The assessment of cumulative effects for the Project was undertaken using a four stage process, which can be summarised as follows:

- Stage 1: identification of a ‘longlist’ of other proposed developments based on the area around the Project that may be affected for each environmental topic considered in the PEIR.
- Stage 2: preparation of a ‘shortlist’ of other proposed developments, which was defined by reviewing the longlist against inclusion/exclusion criteria.
- Stage 3: collection of environmental information (if available) relating to other proposed developments in the shortlist.

- Stage 4: determining if significant cumulative effects were likely to occur between the Project and the other proposed developments in the shortlist.

2.4.4 The shortlisting process identified a number of other proposed developments within the area around the Project that may give rise to potential cumulative effects. These comprised a variety of development types, including residential developments, employment space and solar farms and were included in the assessments.

2.4.5 The inter-related effects between the environmental topics will be evaluated as part of the EIA process and will be reported in the ES. Inter-related effects occur where the combined effect of one or more environmental topics on a single receptor (or a group of receptors) is greater than if the environmental topics were considered in isolation. For example, the inter-related effects of dust, noise, and visual changes during the construction of the Project on nearby residential properties.

2.4.6 Following statutory consultation, the PEIR will be updated and will become the ES. The assessments within the ES will reflect the feedback received during statutory consultation, the findings of the ongoing surveys and the scheme design refinements. The ES will accompany the DCO Application and will follow a similar systematic approach to EIA and project design as the PEIR. The process of identifying environmental effects is both iterative and cyclical, running in tandem with the iterative design process.

3 Planning Policy Context

3.1 National Planning Policy

National Policy Statements (NPS)

3.1.1 The EIA process has considered existing and emerging national planning policy relevant to the Project. In doing so, the application, including the EIA, will consider the National Policy Statements (NPS) that will be important and relevant to the Secretary of State's decision as to whether to grant a DCO for the Project.

3.1.2 NPS are designated under PA 08 and set out the Government's policy for the delivery of energy infrastructure, providing the legal framework for planning decisions. The current extant suite of NPS was published in 2011.

3.1.3 In November 2020, the National Infrastructure Strategy established a National Infrastructure Planning Reform Programme, to make the NSIP system more effective. A 'call for evidence' process began in November 2021 with the commencement of the Government consultation Draft National Policy Statements – Planning for new energy infrastructure. This ran between the 6th of September and the 29th of November 2021, with the draft NPS also being the subject or parliamentary scrutiny between the 6th September 2021 and the 28th February 2022.

3.1.4 Government published a response to the 2021 consultation, which resulted in the strengthening of the NPS in line with the British Energy Security Strategy. A second consultation on the documents, entitled "Nationally Significant Infrastructure: action plan for reforms to the planning process" was published on 23rd February 2023 and closed on the 25th of May 2023.

3.1.5 The energy NPS subject to consultation comprised the overarching NPS for energy (EN-1) alongside technology-specific NPS (EN-2 to EN-5):

- Draft EN-1: Overarching NPS
- Draft EN-2: Fossil fuel electricity generating infrastructure
- Draft EN-3: Renewable Energy infrastructure
- Draft EN-4: Gas supply infrastructure & gas and oil pipelines
- Draft EN-5: Electricity Networks Infrastructure

3.1.6 EN-1 sets out the 'need case' for energy infrastructure projects, and planning guidance on assessment criteria that are common across a number of technologies. EN-2 to EN-5 refer to the need case in EN-1 and include planning guidance on the assessment of technology specific criteria.

3.1.7 The revisions proposed to draft EN-3 Renewable energy infrastructure emphasise the central role that solar will play in decarbonising the energy sector. The scale of such proposals and their impacts are also recognised.

National Planning Policy Framework (NPPF)

3.1.8 The National Planning Policy Framework (NPPF), published in 2012 and revised in September 2023, sets out the Government's planning policies for England and how these are to be applied, supported by the National Planning Practice Guidance (NPPG).

3.1.9 NPPF paragraph 5 sets out that NSIP will be determined in accordance with national policy statements, other relevant matters and the NPPF. It reads,

"The Framework does not contain specific policies for nationally significant infrastructure projects. These are determined in accordance with the decision-making framework in the Planning Act 2008 (as amended) and relevant national policy statements for major infrastructure, as well as any other matters that are relevant (which may include the National Planning Policy Framework). National policy statements form part of the overall framework of national planning policy, and may be a material consideration in preparing plans and making decisions on planning applications."

3.1.10 Detailed analysis of the relevant considerations arising from the NPS and the NPPF has been considered for each environmental topic of the PEIR.

3.2 Local Planning Policy

3.2.1 The Project lies within the administrative areas of West Oxfordshire, Cherwell and Vale of White Horse Districts, and within Oxfordshire County Council, and for the area within which the Project sits the adopted Development Plans currently comprise the following;

- West Oxfordshire Local Plan 2031, adopted in 2018, supplemented by the Salt Cross Garden Village Area Action Plan, adopted in 2022;
- the 'made' Neighbourhood Plans for Woodstock (2023) and Eynsham (2020);
- Cherwell Local Plan 2011-2031 (Part 1) including saved policies from the Cherwell Local Plan 1996, and its Partial Review, adopted in 2020, to support Oxford's unmet housing needs;
- Vale of White Horse Local Plan 2031 Parts 1 and 2;
- the 'made' Neighbourhood Plan for Cumnor (2021); and
- the Oxfordshire Minerals & Waste Local Plan (2017).

3.2.2 The Applicant has had regard to relevant local policies in compiling this PEIR, and will continue to do so in preparing the Planning Supporting Statement, the ES and Statements of Common Ground to be prepared with the host authorities.

4 Need and Alternatives Considered

4.1 Introduction

4.1.1 This section provides a summary of the need for the Project and the main alternatives considered by the Applicant during the project development and EIA process. As part of the EIA process, the Applicant considered alternatives for the selection of the site, its scale, alongside alternative design and layout options and chose the most appropriate.

4.2 Need

4.2.1 There is a strong need case for the increase in UK based renewable energy due to commitments and obligations at international level, such as the Kyoto Protocol and COP21 and more recently COP26. At a national level, legally binding targets of net zero by 2050, the phasing out of fossil fuel generation by 2035 and an expansion of low carbon energy supplies so that renewable make up 80% of the generation by 2050 all further support the urgent need case for the Project.

4.2.2 Looking at solar specifically, the UK Energy Security strategy highlights the importance of solar energy in the move towards renewables and it outlines that it seeks solar generation to reach 70 GW by 2035. Given the generating capacity of the Project, if consented the Project would significantly help contribute towards this need.

4.3 Alternatives

4.3.1 The location of the proposed site was driven by a number of factors. Discussions were held with National Grid to identify where their priorities were to meet demand and manage the UK electricity supply network. As a result, PVDP became aware that National Grid wished to invest in reinforcing and extending the grid network in the Oxfordshire area, partly in response to Oxfordshire's fast-growing economy and the increasing demand for electricity.

4.3.2 The location and overall size of the project has been influenced by landscape, cultural heritage, ecology, and other environmental and planning designations including land ownership, commercial viability and availability of a suitable grid connection. The precise boundaries will continue to be refined as necessary in response to known or assumed physical and environmental constraints and additional surveys and baseline studies.

Site Layout and Design

4.3.3 Since the early stages of the feasibility of the Project, the Applicant has produced a high-level constraints plan to understand site sensitivities in planning and environmental terms. The evaluation of site constraints presented an opportunity to provide the following;

- area for habitat enhancement, including planting of native species and opportunity to enhance existing habitat;

- ability to enhance the landscape and provide screening for the Project;
- provide safe and optimal access to the Site from the adjacent road network and enhance the existing network of public rights of way, through landscaping and additional footpaths where none existed before.

4.3.4 The EIA process has influenced the iterative design process of the Project, through the identification of environmental constraints, consideration of responses received during the consultation process, and identification of environmental effects.

4.3.5 Measures have been included within the Project to reduce the adverse effects on environmental receptors. The design parameters approach to accommodate emerging technology has the potential to further reduce environmental effects. Therefore, there have been a number of iterations and refinements to the layout of the Project.

4.3.6 The final layout for the Project will continue to evolve as the scheme development process and consultation and engagement continues. For assessment purposes, maximum and minimum design parameters have been set for key components of the Project where there is still flexibility over the final layout and design, for which the Applicant will seek consent.

Choice of Solar Array and Cable System and Route

4.3.7 The Project has considered the type of solar arrays to be used in terms of scale as well as whether to use fixed or rotating frames. They have chosen to adopt a flexible approach to the overall height above ground of the solar arrays, ranging from 1.8 to 2.5m above ground level. This was to allow for the possibility of allowing sheep farming beneath the panels.

4.3.8 The Project also incorporates fixed arrays rather than rotating. The reason for this is largely cost, due to the size of the Project, and the absence of significant gains to be made to offset the higher cost of rotating array option. In addition, it was considered that rotating arrays would not only broaden the impact area, but in doing so may lead to increased potential for adverse glint and glare effects which the Applicant has sought to avoid.

4.3.9 The cable system has also been the subject of evaluation in terms of its optimum route and method of laying the cables. The route has evolved over the past year but with a clear view from the outset that it should avoid or minimise its impact upon the environment. In light of this it was decided that where possible the cable route should be located within the existing highway where possible, but where it needed to cross open land then routes or route options have been selected which avoid impact on archaeologically sensitive areas, away from sensitive receptors where possible, and would be laid using a cut and cover technique.

4.3.10 However, where features were encountered along the route which were considered sensitive, or where cut and cover would be inappropriate, horizontal directional drilling (HDD) method of cable laying will be applied. This will apply where the cable crosses the Thames in the vicinity of Swinford Bridge, the railway line, any tree hedgerow boundary and in the vicinity of several roads.

5 Project Description

5.1 Introduction and Overview of Project

5.1.1 This section provides a summary of the Project and associated developments and also includes information on the design parameters used for assessment purposes in this PEIR.

5.1.2 The Applicant seeks consent to install and operate approximately 840MWe of solar generation development in parts of WODC, CDC and VWHDC. By delivering approximately 1,307 MWp of power to the National Grid it aims to provide secure and clean energy to the equivalent of approximately 330,000 homes.

5.1.3 The Project will connect to a new National Grid Electricity Transmission (NGET) system, via a new National Grid 400kV substation, to be located close to the existing National Grid 400kV line that runs between Cowley, in Oxford, and Walham in Gloucestershire.

5.2 Location of Project

5.2.1 All of the Project will be located within the county of Oxfordshire which has a total area of approximately 1,300 ha. The Project extends from an area of land in the north (the Northern Site), situated between the A4260 and the Dorn River Valley near Tackley and Wootton, through a central section (the Central Site), situated broadly between Bladon and Cassington, and connecting to a section further south near to Farmoor Reservoir and north of Cumnor (the Southern Site), where the Project will connect to the NGET system.

5.2.2 The majority of the land proposed for the Project is currently used for arable crops or is otherwise down to pasture.

5.2.3 The precise extent of the site and the solar installation areas is still being informed by ongoing environmental assessment work and by technical and commercial factors, but the intention is that the Project will be confined to the Project Site boundary as shown on Figure 1: Site Location Plan. This boundary also allows for land used temporarily, including land for construction compounds and cable route options.

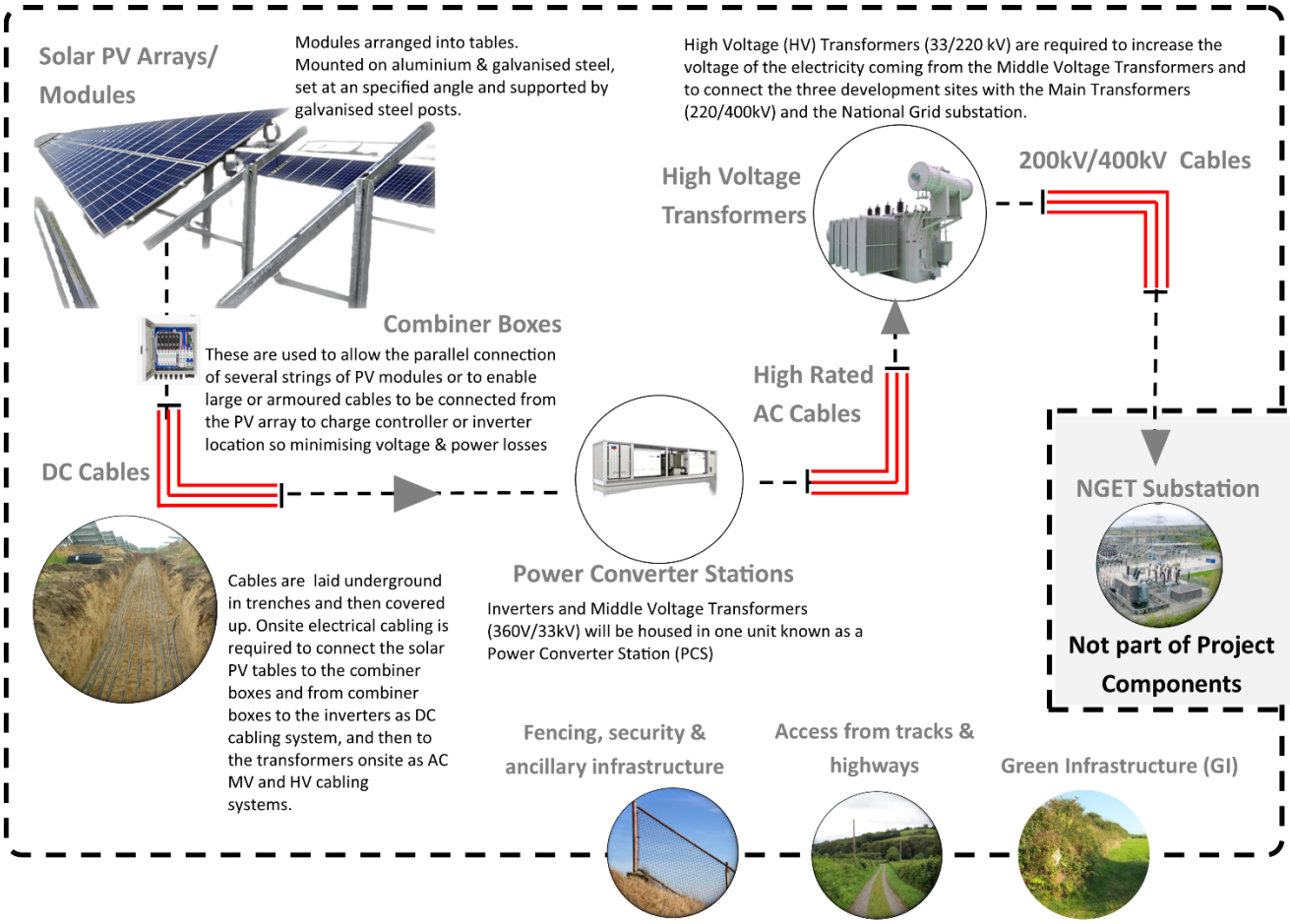
5.3 Key Components of the Project and Details

5.3.1 The key components of the Project comprise the following, which have been illustrated in Diagram 5.3.1 below:

- Solar PV Modules;
- Onsite cabling;
- Power Converter Stations (i.e. project substations and control buildings) and supporting equipment;
- High Voltage Transformers, including feeders, switchgear and supporting equipment;
- Electricity export cabling and connection to the NGET substation;

- Fencing, security and ancillary infrastructure;
- Accesses from the highway and tracks; and
- Green infrastructure (GI).

Diagram 5.3.2: Key Components of the Project



Source of Diagram: RPS (Not to Scale – for illustration purposes only)

5.3.2 The Project's solar arrays (comprising all the mounting structures, frames and foundations) will be connected by underground electrical cables within each section of the site, and via underground electric cable to the substation at the grid connection point. The interconnecting cable route will largely follow the public highway, but some parts will cross land controlled by the Applicant.

5.3.3 The Project site is also capable of providing areas suitable for sheep farming and small-scale food production, although these areas are not yet defined.

Solar Design Parameters

5.3.4 The design parameters for key components used for assessment purposes in this PEIR and ultimately in the Environmental Statement that will accompany the DCO submission, are summarised in Table 5.1 below. Depending on the topic examined, it is the likely worst case parameter that is used to identify

relevant environmental impacts and then to assess the significance of any environmental effect.

Table 5.1: Solar Design Parameters for Key Components

Project Component	Current Detail	Parameter
Site Areas		
Total developable area for solar arrays – Northern Site	Approx. 266 ha	Approx. 266 ha
Total Developable area for solar array – Central Site	Approx. 572 ha	Approx. 572 ha
Total Developable areas for solar array – Southern Site	Approx. 51 ha	Approx. 51 ha
Solar modules		
Indicative Number of Solar PV Modules	Approx. 2,058,904	Range (1,800,000 to 2,300,000 modules)
Watts peak (Wp)	1,307 MWp	1200 to 1375 MWp
Indicative Solar PV Module Dimensions	Width (m) 1.30	1.1 to 1.4 m
	Length (m) 2.38	2.1 to 2.4 m
	Depth (mm) 0.33	0.30 to 0.40 mm
	Area (m^2) 3.1	2.3 to 3.5 m^2
Indicative Slope of Solar PV Modules from Horizontal	15 degrees	12 to 18 degrees
Min height of Solar PV modules above ground level (AGL)	0.6 m	0.6 to 1.8m
Max height of Solar PV modules above ground level (AGL)	1.8 m to 2.5 m	1.8 m to 2.5 m
Indicative Solar PV Module Colour	Dark Blue	Dark blue/dark grey/or black
Frame type	Anodized Aluminium Alloy	Anodized Aluminium Alloy
Indicative Mounting Structure Material – Use of concrete shoes is possible, but only in areas of high archaeology interest	Mix between galvanized steel and aluminium fixed tilt with stainless steel screws and clamps.	Mix between galvanized steel and aluminium fixed tilt with stainless steel screws and clamps.
Distance between site boundary and table areas (m)	7.00 m	6.0 m to 100.0 m
Indicative Foundation Type	Driven-piles or screw piles	Driven-piles or screw piles
Indicative Total number of piles - Use of concrete shoes is possible, but only in areas of high archaeology interest	Max. Number of piles: 1,968,722	1,900,000 to 2,500,000
Depth of piles below ground level (m)	1.5 m to 2.0 m	1.0 m to 3 m
Electrical Components		
Indicative Number Power Converter Stations (PCS). each containing a MV transformer [6 MVA]	156 Power Converter Stations	1 per 7ha
Power converter station (PCS) Dimensions	Height (m) – 2.89	2.7 – 3.5 m
	Width (m) – 12.2	12.0 – 14.0 m
	Depth (m) – 2.44	2.2 – 2.9 m
Indicative Number of HV Transformer (Secondary substation) - 50 dB (10 m distance)	6 no. 33/220 kV	4 to 8 nos.
Indicative HV Transformer Dimensions (Main Substation)	Footprint: 140 x 62m	Footprint: 1 ha

Project Component	Current Detail	Parameter
		(10,000 m^2)
Indicative HV Transformer Dimensions (Secondary Substation)	Length (m) - 15	Length 12 – 18 m
	Width (m) - 8	Width 6 – 10 m
	Height (m) – 5.0m plus height of isolator	Height 4.0 m – 6.0 m (inc. isolator)
Indicative Transformer Foundation Dimensions (below ground level)	Length (m) - 20	Length 19 – 22.0m
	Width (m) - 19	Width 18 – 21m
	Height (m) - 1	Height 0 – 1.0 m
Electrical Cabling maybe included in mounting structure		
DC Cables from Solar PV Modules to Inverters – DC string cables in the mounting structure, DC collection cables in underground trenches	Depth: between approx. 0.40 and 0.80 m	Depth: between approx. 0.40 and 0.80 m
AC Cables from Transformers to Secondary Substation (HV Transformer) (33/220kV)	Depth Roadways: 0.75 - 0.85 m Fields: approx. 0.91 -1.2 m Footpaths, verges: approx. 0.75 – 0.85 m	Depth: Roadways: 0.75 - 0.85 m Fields: 0.91 - 1.2 m Footpaths, verges: 0.75 – 0.85 m
NGET substation	Footprint 165 x 135 m Max height – 14 m Site area – 2.3ha	Footprint 180 x 150 m Max height 12 – 15 m Site area 3.8ha
Source of Data : PVDP on behalf of the Applicant, SolarFive		

Solar PV Array Areas and Mounting Structure

5.3.5 The proposed solar PV modules convert solar irradiance (light) into direct current (DC) electricity. They are designed to maximise the absorbency of the sun's rays and minimise solar glare.

5.3.6 The individual solar PV modules within the development site are likely to consist of dark blue, and/or dark grey and / or black, photovoltaic (PV) cells. A range of alternative PV technologies is developing rapidly and may be available at the time of construction, therefore the solar PV modules are not limited to a particular type of PV cell. The modules are likely to be between 1.8m to 2.5m above ground level in height, although lower modules of 0.6m to 1.8m may be used in some areas. The arrays will be fixed, not rotating.

5.3.7 The solar PV modules are expected to be mounted on a metal framework using a mix between galvanised steel and aluminium with stainless steel, supported by galvanised steel piles or screws driven into the ground by an impact piling or screwing rig to a depth of approximately 1.5 to 2 m. In sensitive areas of archaeology, 'concrete shoes' (or similar) might be used to hold the frame to the ground, rather than piling, to avoid underground impacts on any archaeology.

5.3.8 As shown in Diagram 1, a network of other infrastructure is connected to the Solar PV Array. These include electrical installations such as transformers, inverters, power convertor stations (PCS), high voltage (HV) and middle

voltage (MV) transformers and associated electrical cabling which will be routed through underground cable trenches.

5.3.9 MV Transformers (1kV/33kV) and switchgear will be housed in one unit known as a Power Converter Station (PCS). There will be approximately 156 PCS located within the solar PV installation area. The dimensions of a PCS are approximately 12m long and 3m high. Inverters might also be located within the PCS.

5.3.10 High Voltage (HV) Transformers (33/220 kV) are required to increase the voltage of the electricity coming from the MV Transformers and to connect the three development sites with the Main Transformers (220/400kV) and the NGET substation. The HV Transformers will be located within the solar PV installation area. In total, there are likely to be six HV Transformers and two Main Transformers (220/400kV). The dimensions of a HV transformer are approximately 18m long and 6m high.

5.3.11 On site electrical cabling is required to connect the solar PV tables to the combiner boxes and from combiner boxes to the inverters as DC cabling system, and then to the transformers on site as AC, MV and HV cabling systems.

5.3.12 Alternate Current (AC) cables from the inverters to the substation will be routed through underground cable trenches. The AC cables between the transformers and the Project substation will be buried with depths ranging from 0.75 m to 1.2 m depending on land and its use.

Landscaping

5.3.13 Planting and management of grassland, hedgerows, trees and areas of scrub is proposed across the site for landscape, visual and biodiversity mitigation and enhancement. Landscape mitigation will be embedded in the overall project design and would be formulated to minimise potential landscape and visual impacts and maximise enhancement of landscape features, landscape character and biodiversity of the site.

5.3.14 Areas under and around the panels will develop vegetation that is fit for grazing by sheep or can be cut back to produce compost. In areas not affecting power generation vegetation growth will be facilitated to improve biodiversity.

5.3.15 Any necessary mitigation measures will be undertaken on additional areas, to be defined in the course of consultations. Further actions will be undertaken, where necessary, to reduce the visual impact of the project by observing reasonable distances and additional planting.

5.3.16 Earthworks on the Site (e.g., transformer foundation excavations) may result in a small surplus of material within areas of the Site. This material will be reused in landscaping and restoration of the Site during and after construction, and will not be exported.

Fencing, Lighting, Access and CCTV

5.3.17 Fencing, lighting and new vehicular accesses will also need to be constructed for the Project. The fencing will be for operational security purposes and may

be up to 2.1m in height. Lighting and CCTV will be installed too, but on limited areas of the development, generally around the high voltage infrastructure. Access requirements both temporary and permanent are being considered as part of the Project design.

5.3.18 The large, mostly arable, areas within the Site have been sub-divided using existing physical features such as hedgerow, ditches and overhead power lines, into developable land parcels.

Site Access

5.3.19 Vehicular access to serve the installation areas will either be through existing field entrances or purpose-built new access roads. Further details of all vehicular access points, including temporary compounds, will be identified, described, assessed and appropriate plans produced at the Environmental Statement stage.

5.4 Construction

5.4.1 The construction of all aspects of the Project is subject to the final Project design and potential environmental constraints. It is anticipated to last approximately 24 months, plus a period for testing and commissioning. The indicative start date for construction is dependent on when the necessary consents are granted, but is likely to be in Q1 2025 and construction to commence approximately 6 months later. The following are the main construction activities:

- Site preparation
- Delivery of construction material, plant and equipment to site
- Establishment of the perimeter fence and main construction compound(s)
- Solar PV module and associated infrastructure construction, comprising;
  - Delivery of components to site
  - Erection of module mounting structures
  - Installation of modules and power converter stations
  - Trenching and installation of electric cabling
  - Transformer foundation excavation and construction
  - Testing and commissioning
- Landscaping and other environmental enhancements

5.4.2 There will be four main temporary construction compounds in the Project Sites, one in the Northern Site, two in the Central Site and one in the Southern Site. The temporary construction compounds will be carefully located in order to minimise environmental or amenity impact. Topsoil and subsoil will be stripped from such areas and stored on site for replacement following the completion of construction works.

5.4.3 Each compound will have fencing and suitable hard standing, offices, welfare facilities and generators to supply electricity. The temporary construction compounds will be returned to original state upon completing construction.

5.5 Operational Development

5.5.1 During the operational phase, activity on the Site will be minimal and will be restricted principally to landscape and ecology management, equipment/infrastructure maintenance and servicing including cleaning and replacement of any components that fail, and monitoring to ensure the continued effective operation of the development. Operational and maintenance staff may require access to the Site during daylight hours, seven days a week.

5.5.2 The undeveloped areas of the site will be designed and managed to enhance the landscape and ecological value of the area. The Applicant and the landowners are keen to secure these and any other benefits that the local community and other stakeholders may wish to promote. Discussions are advanced in respect of allowing land to be given over to community groups for small scale food production, and for some parts of the site to be given over to sheep farming. Further details in respect to these elements will continue to be developed and refined, including the relevant management plans for these and other areas of the site. The intention is to report this information within the Environmental Statement that will accompany the Applicants' DCO submission.

5.5.2.1 For clarity, the Project does not incorporate any battery storage. Energy generated by the Project will be stored, as required, by Battery Energy Storage Systems (BESS) that are connected to the Grid elsewhere, including the EDF 50MW BESS located at Cowley substation.

5.6 Decommissioning and Enhancement

5.6.1 The consent being sought by the Project is a temporary one. The Project will have a 35 year lease with the option to extend to 42 years. Within this timeframe the Project will be constructed, become operational and be decommissioned. Decommissioning is anticipated to start 2 years before the end of the lease and is expected to be completed in that time. All infrastructure associated with the development is anticipated to be removed, and exception to this is assumed to be all cables in the public highway (as it could either remain in situ or removed as part of decommissioning). The National Grid substation will however remain and the remaining land will revert back to its previous use.

5.6.2 A decommissioning and enhancement plan, to include timescales and transportation methods, ecological and landscape enhancements and other environmental improvements, will be developed in consultation the local planning authority, local community and key stakeholders and form and integral part of the DCO application.

6 Summary of Environmental Effects

6.1.1 This section provides a summary of the preliminary findings of the environmental assessments undertaken to date for all topics. Figures supporting the environmental assessments have been provided in Figure 2: Landscape Designations and Green Belt and Figure 3: Heritage Designations with Zone of Visual Visibility.

6.1.2 The process of identifying environmental effects is both iterative and cyclical, running in tandem with the iterative design process. Therefore, after the statutory consultation period, the following sections for each environmental topics will be updated and the assessments will reflect the feedback received during statutory consultation, the findings of the ongoing surveys and the scheme design refinements.

6.1.3 The same process will be applied to the mitigation measures proposed at the PEIR stage which is an ongoing process and any changes and updates will be reflected in the ES and accompanying NTS. As part of the mitigation measures a number of environmental topics refer to various documents that will be prepared as part of the ES, for e.g. Outline Code of Construction Practice (CoCP), Outline Pollution Prevention Plan (PPP) etc. These documents will be worked up in detail during pre-construction stages as secured by the DCO requirement.

6.1.4 Cumulative assessment was also carried out for each of the environmental topics with a few exceptions e.g. traffic and transport, socio economics and waste.

6.1.5 The assessment of inter-related effects for the Project will be undertaken following completion of the assessments for each of the environmental topics in the ES and therefore not presented in the following sections. Following completion of the assessments, a review process will be carried out to identify receptors likely to be affected by one or more of the environmental topics. An assessment will then be undertaken to determine how individual effects for each environmental topic may combine to create significant inter-related effects on identified receptors. These will then be presented in the ES and the NTS that accompanies it.

6.2 Historic Environment

Introduction

6.2.1 This section presents a summary of the assessment of the likely significant effects on the historic environment during the construction, operation and maintenance, and decommissioning of the Project. The assessment covers all aspects of the historic environment including buried archaeological remains, historic buildings and areas, and the character of the historic landscape.

Assessment Methodology

6.2.2 The historic environment baseline was established through a combination of desk-based studies using appropriate sources of data, along with site visits

and a purposive programme of geophysical survey. A specialist review of historic aerial photography and LiDAR information was also undertaken.

6.2.3 Additional work will be carried out prior to the submission of the ES, to further enhance the understanding of the baseline, including the completion of the geophysical survey followed by supplementary fieldwork as appropriate.

6.2.4 The site visits were aimed at gaining an understanding of the current settings of key designated heritage assets, in order to be able to assess whether the Project could result in a change within the setting which could harm the significance of the heritage assets. The Zone of Theoretical Visibility (ZTV) was also utilised within this part of the assessment. A ZTV is a computer-generated tool which identifies the likely extent (theoretical) of visibility of the Project on the terrain and helps to identify locations for Representative Viewpoints (see Figure 3: Heritage Designations with Zone of Visual Visibility).

Current Baseline Environment

6.2.5 The Blenheim Palace World Heritage Site (WHS) is located just to the west of the Project Site. The boundary of the World Heritage Site is almost contiguous with the boundary of the Blenheim Palace Grade I Registered Park and Garden whilst this defined historic landscape also contains numerous listed buildings including the palace, the water terrace gardens and Bernini fountain, the Grand Bridge and the New Bridge (all listed as Grade I).

6.2.6 There are concentrations of listed buildings within the settlements close to the perimeter of the Project Site such as Woodstock, Bladon, Begbroke, Wootton, Church Hanborough, Cassington and Cumnor. Outside of the settlements, listed buildings close to the perimeter of the Project Site include the Grade II* listed Hordley House and nearby Grade II listed gazebo, also a number of Grade II listed buildings at Lower Dornford Farm, Old Man Leys Farm, Spring Hill, Burleigh Farmhouse, Rectory Farmhouse and The Old Rectory (both in Worton), City Farm, Eynsham Mill and Upper Whitley Farm.

6.2.7 The Roman road known as Akeman Street passes through the Northern Site on a north-east/south-west alignment. Land directly adjacent to the perimeter of the proposed development site in this area has been designated as a Scheduled Monument due to the presence of a Roman villa or possibly a small town here, and evidence suggests that the area of Roman activity extends beyond the Scheduled area.

6.2.8 A second Scheduled Roman villa is located to the east of the Blenheim Palace WHS whilst further south a hillfort on Bladon Heath (and known as Bladon Camp) is also Scheduled. Its location within the well-drained landscape of the Thames Valley means that there is reasonable potential for buried archaeological remains to be present within all parts of the Project Site. Investigations undertaken in connection with gravel extraction around Purwell Farm in the Central Site identified activity from the Bronze Age and the Iron Age as well as extensive evidence of settlement, industry and burial during the Anglo-Saxon period.

6.2.9 Elsewhere within the Project Site, features recorded as cropmarks on aerial photographs include enclosures as well as ring ditches that may represent the remains of burial monuments of probable Bronze Age. The geophysical

surveys undertaken across the Project Site have provided additional detail with regard to some of those features recorded as cropmarks. The surveys have also identified 'new' archaeological sites and features, i.e. ones not known from desk-based sources. These include sites potentially of national importance.

6.2.10 Artefacts recovered from various locations within the proposed development site include material dating from the Mesolithic period through to the Post-medieval and Modern eras.

Mitigation Measures

6.2.11 Mitigation has primarily been through input into the design of the Project. Direct physical impacts on designated heritage assets have been avoided by ensuring that such assets are generally excluded from the Project Site. Small areas of land comprising parts of two Conservation Areas (Bladon and Church Hanborough) do fall within the Project Site, but these areas are not proposed to be developed for the Project but would instead be used for environmental mitigation purposes. The Project design also includes the establishment of buffer zones and the use of new planting and enhancement of existing vegetation to screen views towards the Project.

6.2.12 Where the desk-based studies and purposive fieldwork have identified the presence of significant archaeological sites and features in several areas within the Project Site, development has largely been excluded from these areas which would instead be used for environmental mitigation purposes.

6.2.13 Where archaeological sites and features of a lower level of significance have been identified within the Project Site, mitigation could take the form of avoidance or a 'no-dig' approach in which the solar PV panels are placed on concrete 'shoes' or similar and the cables are placed in suspended troughs rather than within trenches. This would need to be agreed with the appropriate stakeholders.

Potential Likely Significant Effects

6.2.14 No significant effects in respect of any aspect of the historic environment have been identified within the PEIR. However, it should be noted that the assessment of effects with regard to the Blenheim Palace WHS is being undertaken through a separate 'Heritage Impact Assessment' process (in line with the relevant guidance). A preliminary Heritage Impact Assessment of the WHS is attached at appendix (7.4) to Chapter 7.

6.2.15 The effects on designated heritage assets as a result of change within their setting have been assessed as not significant. These effects are fully reversible in that they would cease following decommissioning of the Project.

6.2.16 The effects on buried archaeological remains resulting from physical impacts have also been assessed as being not significant as a result of the mitigation described above.

6.2.17 The cumulative impacts assessed impacts on designated heritage assets as a result of change within their setting and the impacts on the character of the historic landscape and it is concluded that there are no significant cumulative

effects from the Project alongside other projects/plans. This is because all of the other schemes are relatively small in comparison, although in most cases the impacts of the other schemes are nor time-limited and reversible as they are for the Project. The other schemes may also require removal of elements of the historic landscape such as field boundaries, which is not the case for the Project.

6.2.18 Screening of potential transboundary impacts has identified that there was no potential for significant transboundary effects with regard to historic environment.

6.3 Landscape and Visual Resources

Introduction

6.3.1 The Landscape and Visual Impact Assessment (LVIA) assesses potential impacts of the Project upon the landscape character and visual resources. Landscape and visual resources refer to the existing physical elements of the landscape, landscape character, areas designated for their scenic or landscape-related qualities and views from publicly accessible locations such as settlements, transport routes, and Public Rights of Way (PRoW).

6.3.2 The LVIA considers the potential impact of the Project during the construction, operations and maintenance, and decommissioning phases.

Assessment Methodology

6.3.3 The visual baseline assessment involved a desktop exercise, including production of the Zone of Theoretical Visibility (ZTV), and consultation process to identify appropriate visual receptors and Representative viewpoints within the LVIA Study Area (falling within the Zone of Theoretical Visibility (ZTV). A ZTV is a computer-generated tool which identifies the likely extent (theoretical) of visibility of the Project on the terrain and helps to identify locations for Representative Viewpoints.

6.3.4 The Representative Viewpoints were selected to represent a broad range of locations and sensitive visual receptors throughout the 5 km Study Area. It is considered that, due to distance, there is no potential for significant effects beyond the 5 km buffer from the outer edges of the Project Site, in all directions. Fieldwork was undertaken (during winter months only for the PEIR) to verify the visual receptors and Representative Viewpoint locations, inclusive of photographic panoramas being captured from each Representative Viewpoint location.

6.3.5 For the PEIR, winter Representative Viewpoints in the assessment included a total of 55 located within the 5 km Study Area and falling within the ZTV envelope for the Project. The focus / direction of the Representative Viewpoints were divided between the Northern Site (17 viewpoints), Central Site (31 viewpoints) and the Southern Site (12 viewpoints). Of the 55, 18 representative viewpoints were taken forward for assessment at the PEIR stage. All 55 representative viewpoints will be assessed as part of the ES (see Figure 2: Landscape Designations and Green Belt).

6.3.6 Due to the low level of the solar development and proposed mitigation, there is no potential for any private views to be adversely affected over and above substantial.

Current Baseline Environment

6.3.7 The LVIA Study Area for the Project includes the area of land to be temporarily and permanently occupied during construction, operations and maintenance, and decommissioning phases. This included a 5 km buffer from outer edge of the DCO order limits in all directions, consistent with other schemes of this nature and scale.

6.3.8 The LVIA baseline comprises two distinct but connected aspects; landscape character baseline, including international, national and local designated landscapes, and the visual baseline. Both were collated via a combination of desktop analysis of publicly available data, site-specific surveys and fieldwork, and consultation with relevant stakeholders. These desk and field studies supported the impact assessment work and judgments on the significance of effects. Where data was not available, professional judgement has necessarily been used as appropriate.

Mitigation Measures

6.3.9 A Landscape Masterplan has been developed for the Project which includes the landscape and ecological strategy for implementation and long-term maintenance and management of the Project site. This is likely to include:

- Creation of woodland belts;
- Reinforcement of existing field boundary hedgerows;
- Planting of lengths of new hedgerows along lengths of PRoWs and where existing hedgerows require more extensive infilling;
- Meadow grassland to perimeter of solar array areas and areas of enhancement;
- Planting of individual trees where appropriate; and
- Areas within solar arrays left clear for Skylark plots.

6.3.10 The purpose of these mitigation measures to be adopted are as follows:

- To minimise impact on landform and integrate development into landscape whilst providing spoil cut and fill balance.
- To ensure proposed development is successfully integrated into the landscape and to screen views gained by visual receptors.
- To create diversity within the landscape and visual interest.
- To ensure long-term contribution to landscape features and integration with surrounding agricultural landscape.
- To reflect distinctive landscape character and enhance biodiversity.
- To restore and conserve distinctive landscape character.

Potential Likely Significant Effects

6.3.11 A number of potential impacts upon landscape and visual resources associated with the construction, operational and maintenance, and decommissioning phases of the Project, were identified.

6.3.12 In terms of landscape, effects would be limited. Landscape character effects would be noticeable within the Project site itself. Although with the retention, enhancement and long-term management of existing and proposed vegetation, the effects on the physical characteristics of the landscape would be minimised. When considering the landscape character of the Project site and landscape character areas / types of the wider study area, significant landscape characterisation effects are unlikely.

6.3.13 There are likely to be very few people who would experience significant visual adverse effects as a result of the Project. During construction some temporary significant effects on views are possible but these will be localised, in the short term and before mitigation planting matures. The activities and developments may be barely perceptible when seen at distance, or prominent and at times dominant when in close proximity.

6.3.14 Taking into account the mitigation measures described above, the following significant effects are likely to occur with respect to landscape and visual resources:

- There are no significant adverse effects either temporary and permanent effects on the local landscape character arising from construction and operation of the Project.
- Three significant adverse temporary and permanent effects on the views experienced by users of public rights of way (PRoW) and road users have been identified. These are views from PRoW 416/5/20, northern section of the Project, bridleway 342/1/10, near Banbury Road and PRoW 184/50/20, Oxford Green Belt Way adjacent Farmoor Reservoir, southern section of the Project.
- Significant effects identified are for winter Year 1 only, i.e. before mitigation has been established. There are no significant effects identified once the mitigation matures. No residual significant effects, at summer Year 15, have been identified.

6.3.15 In terms of cumulative effects, the Project has the potential to contribute to localised adverse effects on the Landscape Character Areas / Types within which the Project and cumulative scheme(s) are located. In addition, cumulative adverse visual effects where the Project and cumulative scheme(s) are visible within the same view(s). However, no significant cumulative landscape or visual effects on visual receptors have been identified as a result of the Project.

6.3.16 Screening of potential transboundary impacts has identified that there was no potential for significant transboundary effects with regard to landscape and visual impacts.

6.4 Ecology and Nature Conservation

Introduction

6.4.1 This section presents a summary of the assessment of the likely significant effects on ecology during construction, operation and decommissioning of the Project. This includes with respect to flora, fauna, habitats and designated sites.

Assessment Methodology

6.4.2 The ecology of the Project was characterised via a series of site-specific surveys including those for both habitats and fauna. These surveys followed best practice guidelines and were completed through 2022 and 2023 at appropriate times of the year.

6.4.3 A desk-based study of existing background information was also undertaken by contacting the local records centre and using web-based sources. Records of international designated sites within 10km, national sites within 5km and local sites within 2km were gathered. Species records within 2km were gathered other than for bats where a study area of 10km was used.

6.4.4 The assessment of effects with respect to ecology within the PEIR was undertaken following best practice guidelines (CIEEM 2022). This involves the identification of Important Ecological Features (IEFs) as receptors for the impact assessment.

Current Baseline Environment

6.4.5 The Project site comprises a series of mainly arable fields divided by an extensive hedgerow network. The fields themselves were considered to be of very little ecological value while the hedgerow network was an important feature in the landscape. A small number of water bodies occur within the Project site while the River Evenlode forms a significant landscape feature through the central section of the Project site and is associated with areas of floodplain grazing marsh priority habitat. The Project site boundary has been drawn to avoid blocks of woodland (both broadleaved and designated ancient woodland) although these habitats do occur adjacent to the boundaries of the Project site.

6.4.6 Two international designated sites were identified within the study area – Oxford Meadows Special Area of Conservation (SAC) and Cothill Fen SAC. A total of 15 Sites of Special Scientific Interest (SSSI) were located within 5km of the Project site, two of which (Blenheim Park SSSI and Wytham Woods SSSI) occur adjacent to the Project site boundary. A total of 28 local sites were located within 2km of the Project site boundary, two of which are located within one of the cable route options (Long Mead Local Wildlife Site, LWS, and Swinford Farm Meadow LWS) north of Wytham Woods. A number of other locally designated sites occur adjacent to the Project boundary.

6.4.7 A range of species IEFs were identified through the study programme. This included the presence of great crested newt in two ponds offsite along with a number of badger setts and associated activity. Populations of breeding and

wintering birds were identified, although no individual species occurred in significant numbers, the overall assemblages of species during both periods was considered important.

6.4.8 Bat surveys and the background data search identified a range of species using the site, focused along hedgerows and the Evenlode corridor. Although no specific surveys for otter and dormice were completed, their presence was assumed from the data search, similarly, brown hare and hedgehog. The terrestrial invertebrate assemblage was considered to represent the poor arable habitat present across the majority of the Project site.

6.4.9 Surveys relating to receptors outside the Project site have not been completed due to access restrictions. Such surveys are ongoing and will be completed and reported in the ES.

Mitigation Measures

6.4.10 The Project incorporates a number of mitigation measures to ensure the effects on ecology are minimised. These include:

- The Project has been designed to avoid any removal of hedgerows, woodlands or waterbodies/courses;
- Production of an Outline Code of Construction Practice (CoCP) to ensure effective management of environmental risk during the construction phase of the Project and supporting infrastructure. The Outline CoCP sets out the management measures that the Applicant and its contractors will be required to implement for all construction activities associated with the Project. It will include strategies, control measures and monitoring procedures for managing the potential environmental impacts during the construction phase and limiting disturbance from construction activities as far as reasonably practicable. The CoCP will include regulatory guidance and industry best practice guidance including:
  - A surface and groundwater management plan
  - Construction method statement to include measures to minimise impacts on protected species.
  - Construction method statement for watercourse crossings that will include a bentonite breakout plan.
  - Construction lighting strategy to include methods to minimise impacts to wildlife. Lighting will be designed in accordance with Institute of Lighting Professionals /Bat Conservation Trust guidelines.
  - Dust Management Plan to set out how dust generation will be managed and minimised.
  - Vegetation clearance to be undertaken outside of nesting bird season or following check by Ecology Clerk of Works (ECoW).
  - Invasive Non-Native Species (INNS) Management Plan.
- All hedgerows, trees, ponds and woodland to have minimum of 5m buffer. All buffers to be protected with appropriate fencing, to be set up before construction commences. This distance of buffer is considered the

minimum distance sufficient to ensure impacts to such features are avoided;

- All ancient woodland to have 15m buffer, as per Natural England guidance;
- All watercourses to have 8m buffer, as per Environment Agency guidelines for protection of such features;
- Creation of new landscape-scale corridor along River Evenlode;
- All cable routing outside panel fields to be within hardstanding of highways as far as practicable;
- New skylark plots to be delivered within solar arrays;
- Provision of Outline Landscape and Ecological Management Plan (LEMP) to include details of habitat management to ensure delivery of a significant level of BNG. A LEMP is a site-specific document which details immediate and long-term commitments to manage the planting, protection and enhancement of biodiversity in and around the Project site. These measures will be in accordance with wildlife legislation, National Planning Policy Framework (NPPF) and other local plans and planning policies. The LEMP will include design plans, programmes, specifications, monitoring requirements, responsibilities and costs. It will also include any temporary land take for construction compounds etc. to be restored to habitats of existing or greater ecological value. The Outline LEMP will also include details of ecological enhancements to be sited around the Project to include:
  - bee hives;
  - log piles and other refugia;
  - bird boxes on retained trees; and
  - bat boxes on retained trees.

6.4.11 In addition, any necessary mitigation licence for impacts to protected species will also be considered, depending on the results of updated pre-commencement surveys.

Potential Likely Significant Effects

6.4.12 After the application of mitigation, the majority of potential impacts resulting from the Project on the majority of IEFs were considered not significant. This includes with respect to habitat loss, disturbance, pollution events, dust generation and the spread of INNS.

6.4.13 Significant adverse effects were identified on the wintering bird assemblage as a result of habitat loss, primarily the loss of arable fields during construction. It is anticipated that the creation of new habitats during the Project will mitigate this to some extent during the operational period of the project.

6.4.14 The creation of new habitat within the Project is predicted to result in significant beneficial effects on a range of IEFs including national sites, local sites, hedgerows, water bodies, breeding birds, great crested newts, bats and dormice.

6.4.15 The significance of cumulative effects upon ecology receptors arising from each identified impact was carried out and no significant adverse cumulative effects on ecology and nature conservation were identified as a result of the Project. This is due to the use of various mitigation measures in place such as CoCP.

6.4.16 Screening of potential transboundary impacts has identified that there was no potential for significant transboundary effects with regard to ecology and nature conservation.

6.5 Hydrology and Flood Risk

Introduction

6.5.1.1 This section presents a summary of the assessment of the likely significant effects flood risk and deterioration in water quality within Environment Agency (EA) Main Rivers and Ordinary Watercourses during construction, operation and decommissioning of the Project.

Assessment methodology

6.5.1.2 Existing hydrological conditions were established using a detailed desk review of existing studies and data sets. Technical studies were undertaken to support the PEIR which included the following studies and production of reports;

- The Flood Risk Assessment (FRA) and conceptual drainage strategy;
- Hydraulic modelling report;
- Hydrology report;
- Surface water abstraction licences, discharge consents and pollution incidents technical report; and

Current Baseline Environment

6.5.1.3 The hydrology and flood risk study area is located within the Thames River Basin District and Environment Agency Flood Zones 1, 2 and 3. Flooding within the hydrology and flood risk study is predominantly associated with fluvial flooding. Flood risk has also been assessed from tidal, surface water, groundwater, sewer and artificial sources.

6.5.1.4 Development within each solar farm site is to be limited to Flood Zone 1. As extents of the study area associated with the cable route are located within Flood Zone 3, a sequential and exception test is required and to be passed. The aim of the sequential test is to locate development in areas at lowest risk of flooding first, by ensuring that there are no other appropriate and available sites at a lower risk of flooding. The exceptions test looks at the safety of the site and must demonstrate that the development will be safe from flooding for its lifetime, and that it will not increase flood risk elsewhere.

Mitigation Measures

6.5.1.5 Several measures are proposed as part of the Project to mitigate potential impacts on hydrology and flood risk during construction and operation. These include:

- Drainage strategy to be incorporated into the primary substation, secondary substation, PCS units and operation and maintenance facility design to attenuate any increase in surface water runoff, in turn increase in flood risk.
- Temporary haul road(s) will be installed using permeable gravel aggregate with a geotextile or other type of protective matting, or plastic or metal plates or grating.
- Appropriate seeded vegetation will be provided below and between rows of the solar PV modules to act as a filter strip to dissipate energy of surface water and promote low erosivity sheet flow during operation of the solar farm. The vegetation will be managed organically and will either be mowed or used for light grazing. The grassland will not only grow between array gaps.
- Swales, comprising appropriately seeded vegetation, may be provided along the downstream perimeter of solar PV module parcels to capture and attenuate any exceedance flows from solar PV modules following high intensity rainfall events.
- An Outline Pollution Prevention Plan (PPP) will be prepared and submitted with the application for development consent. Good practice guidance detailed in the Environment Agency's Pollution Prevention Guidance notes (including Pollution Prevention Guidance notes 01, 05, 08 and 21) will be followed where appropriate, or the latest relevant available guidance.
- An Outline Infrastructure Drainage Strategy will be prepared and submitted with the application for development consent.
- An Outline CoCP will be prepared and submitted with the application for development consent.
- Where the export cable corridor crosses sites of particular sensitivity (e.g., ordinary watercourses, EA Main Rivers) a hydrogeological risk assessment will be undertaken to inform a site-specific crossing method statement.
- Where reasonably practicable/feasible EA Main Rivers, ordinary watercourses, flood defences will be crossed by Horizontal Directional Drilling (HDD) or using other trenchless methods. HDD (or other trenchless methodology) entry and exit points will be located at least 10 m away from ordinary watercourses and 10 m from EA Main Rivers or the landward toe of flood defences. The entry and exit points of a HDD are where the drilling rig enters the land at an angle (entry) and then comes out the other side of the crossing (exit).

- Up to a 10m buffer will be maintained between the banks of ordinary watercourses, Main Rivers and temporary and permanent development associated with the Project.

Potential Likely Significant Effects

6.5.1.6 Potential impacts include increased flood risk, contamination of surface waters and damage to field drainage, water supply and drainage infrastructure have been identified during construction, operation and decommissioning of the Project. Taking into account mitigation measures, no significant effects are likely to occur with respect to hydrology and flood risk during the construction, operation and decommissioning phases of the project.

6.5.1.7 Cumulative impacts from projects screened into the assessment have been assessed. It is assumed that each development would be constructed in line with the requirements of the National Planning Policy Framework and Planning Practice Guidance ID7 – Flood Risk and Coastal Change, (and where relevant the National Policy Statements) requiring that new developments attenuate surface water runoff to where practicable to the greenfield runoff rate through a surface water management plan and/or drainage scheme. Therefore, no significant effects are predicted to result with respect to cumulative impacts.

6.5.1.8 Screening of potential transboundary impacts has identified that there was no potential for significant transboundary effects with regard to hydrology and flood risk.

6.6 Ground Conditions

Introduction

6.6.1 This section presents a summary of the assessment of the likely significant effects on geology and ground conditions during construction and operation of the Project.

6.6.2 Ground Conditions refers to the geological and hydrogeological (groundwater) setting of the Project with respect to possible land and groundwater contamination, geo-conservation sites, ground instability and existing mineral reserves and the nature and extent of effects on human health, groundwater and surface water quality and mineral reserves that may result from the construction, operation and decommissioning phases of the Project.

Assessment Methodology

6.6.3 Existing geological and ground conditions including any contamination were established using a detailed desk review of existing studies and data sets. A series of desk based Preliminary Risk Assessments and a Minerals Resource Assessment provided the prime source of data that informed the assessment.

Current Baseline Environment

6.6.4 Baseline surveys undertaken have indicated that the geology of the study area comprises limestone dominated strata of the White Limestone Formation, Cornbrash Formation and the Forest Marble Formation across Botley North,

tending to superficial cover of Alluvium and River Terrace Sands and Gravels and bedrock of mudstones weathering to clays of the Kellaways Clay and Sand Members in Botley Central and the Oxford Clay Formation And West Walton Formation in Botley South.

6.6.5 The geological sequence comprises Primary Aquifers (White Limestone Formation and Forest Marble Formation (limestone)) and Secondary Aquifers (both superficial and bedrock strata) recorded within the North and Central Botley Study Areas. Botley South is located on unproductive Oxford Clay strata. A low risk of ground instability associated with these strata has been identified from British Geological Survey (BGS) sources. No geological conservation sites have been identified within the study area associated with the geological sequence present, however the River Terrace Sands and Gravels in Botley Central have been identified as being part of designated Mineral Safeguarding Areas.

6.6.6 Historical research has indicated a predominantly agricultural past land use for the Project area, the key potential contamination sources being a former railway cutting used as a landfill site for the disposal of a variety of waste types located on the proposed cable route between Botley North and Botley Central, and former sandpits infilled in an area of proposed solar arrays in Botley Central.

Mitigation Measures

6.6.7 Several measures are proposed as part of the Project to mitigate the potential impacts on geology and ground conditions during construction and operation. These include:

- The discovery strategy would comprise a watching brief that would be undertaken by suitably trained personnel during construction activities. The strategy would also include a procedure for construction workers to follow in the event that previously unknown contamination is discovered during the construction phase.
- Further ground investigations would be undertaken in areas with the potential for contamination to exist within the Project site. These ground investigations would inform an appropriate Remediation Strategy.
- The Outline CoCP, which will contain measures to prevent and control accidental spillages of harmful liquids and measures to protect groundwater during construction.
- Where incidental extraction of minerals generates an excess which cannot be retained within the Project site, this material would be exported for reuse offsite.
- A Soil Management Strategy would be prepared as part of the Outline CoCP, which would contain measures to document the management of soils within the Project site and ensure these are undertaken in accordance with best practice.

Potential Likely Significant Effects

6.6.8 Potential impacts of ground contamination upon groundwater, surface water, future site users and off-site users, associated with the construction, operational and maintenance, and decommissioning phases of the Project, were identified. These included mobilisation of ground gases from the former landfill site, mobilisation of leachable contaminants from an infilled former sand pit and the potential for causation of groundwater or soil contamination by construction activity. Taking into account the mitigation measures described above, no significant effects are likely to occur with respect to geology and ground conditions during construction, operational and maintenance, and decommissioning phases of the Project.

6.6.9 Possible impacts on sterilisation of mineral reserves will need to be assessed further through continued consultations with the minerals officer of the county council and review of a Minerals Resource Assessment prepared for the Project.

6.6.10 The Project is not considered to represent a significant risk in terms of contaminated soil and/or groundwater. Therefore, it is not considered that the Project would contribute to any significant adverse cumulative effects in relation to ground conditions and contamination.

6.6.11 No transboundary effects with regard to ground conditions from the Project on the interests of other States were predicted.

6.7 Traffic and Transport

Introduction

6.7.1 This section presents a summary of the assessment of the likely significant effects on traffic and transport during the construction phase of the Project. During operation and maintenance and the decommissioning phases a limited number of additional vehicles will be generated due to the Project and therefore the assessment for these phases have been scoped out as its unlikely to result in any significant effects for traffic and transport.

Assessment Methodology

6.7.2 Traffic and transport relates to the movement demand generated by the Project and its effects upon other road users and surroundings. The base traffic flow data used in the PEIR has been obtained from recognised sources and methodologies and is considered representative of current conditions. The construction traffic flows have been estimated from first principles using reasonable assumptions based upon knowledge and experience and are suitable for the assessment purposes.

6.7.3 The construction phase of the Project is likely to generate the greatest number of vehicle movements as the transportation of construction materials will incur the greatest number of Heavy Goods Vehicle (HGV) and staff movements and it is this phase that the traffic and transport chapter of the PEIR focusses on.

6.7.4 The significance of transport environmental effects has been assessed by considering the interaction between the magnitude of the impacts and the sensitivity of the receptors in the vicinity of transport corridors. The assessment has assessed the construction traffic flows against the baseline traffic flows and considered;

- Driver delay including delay to public transport services;
- Severance;
- Pedestrian delay;
- Pedestrian amenity;
- Accidents and road safety; and
- Abnormal indivisible loads.

Current Baseline Environment

6.7.5 Information on traffic and transport within the initial traffic and transport study area was collected through a detailed review of existing studies and datasets.

6.7.6 A base position has been established by obtaining publicly available traffic survey data, investigating highway link sensitivities, analysing road safety and analysing public transport services and provision and facilities for pedestrians and cyclists. For the purposes of the PEIR, future baseline traffic flows have been calculated by applying traffic growth rates to the base traffic flows. The base traffic flows were obtained from both the Department of Transport (DfT) and OCC.

6.7.7 The initial traffic and transport study area has been identified including the A34 and relevant parts of the local highway network determined as being likely to be used by construction generated vehicles to access construction compounds and Horizontal Directional Drilling (HDD) compounds.

Mitigation Measures

6.7.8 Mitigation measures include limiting the peak daily construction vehicle movements during construction activities and the preparation of an Outline Construction Traffic Management Plan (CTMP) which will be submitted in support of the application for development consent. The CTMP will be discussed and agreed with the relevant Highway Authorities and this will incorporate an outline travel plan for construction staff.

Potential Likely Significant Effects

6.7.9 A number of potential impacts on traffic and transport associated with the construction phase of the Project, were identified and assessed. These included potential impacts on driver delay including delay to public transport services, severance, pedestrian delay, pedestrian amenity, accidents and road safety and abnormal indivisible loads. The impact assessment has identified that the daily construction traffic flows are generally low in comparison to base traffic flows throughout the initial traffic and transport study area.

6.7.10 Only the effect on pedestrian amenity on the B4017 Cumnor Road as a result of the construction vehicle movements was initially identified to be significant in EIA terms (prior to mitigation). This was a result of increased HGV movements. However, it is possible for mitigation to be enacted to limit the number of construction HGV movements along the B4017 Cumnor Road so that the effect would not be significant in EIA terms.

6.7.11 Overall, it is concluded that, following mitigation, there will be no significant effects arising from the Project during the construction, operation and maintenance or decommissioning phases.

6.7.12 The traffic and transport assessment at the PEIR stage sets out the initial traffic and transport study area, the key highway links within this, estimations on the typical daily number of construction vehicle movements and preliminary EIA. Given the nature of other projects and plans evolving as they emerge and progress through the planning process, this evolves the traffic flows generated by those projects and plans accordingly. As such, as the EIA is undertaken, a Cumulative Environmental Assessment (CEA) with these other projects and plans can be undertaken. Therefore, a full cumulative assessment will be set out in the ES.

6.7.13 A screening of transboundary impacts has been carried out and has identified that there was no potential for significant transboundary effects with regard to traffic and transport for the Project upon the interests of other states.

6.8 Air Quality

Introduction

6.8.1 This section presents a summary of the assessment of the likely significant effects on air quality due to the Project. Air quality is a measure used to describe the level of pollutants present within the air. The sources of air pollution for the Project would be dust and particulate matter that can be generated by onsite construction activities and dust which can be tracked out onto the public road network. There may also be changes in atmospheric pollutant concentrations due to the combustion of fuel in vehicles.

6.8.2 The assessment considered the potential impacts of dust deposition, suspended particulate matter, and increases in pollutant concentrations on human and ecological receptors arising from construction works. The potential effects of deposited dust, increased particulate matter and vehicle emissions generated during the operations and maintenance phase of the Project have been scoped out as not significant.

Assessment Methodology

6.8.3 The effects of dust are linked to particle size and two main categories are usually considered:

- PM_{10} particles, those up to 10 µm in diameter, remain suspended in the air for long periods and are small enough to be breathed in and so can potentially impact on health; and

- Dust, generally considered to be particles larger than 10 µm which fall out of the air quite quickly and can soil surfaces (e.g. a car, window-sill, laundry). Additionally, dust can potentially have adverse effects on vegetation and fauna at sensitive habitat sites.

6.8.4 Consistent with the recommendations in the Institute of Air Quality Management (IAQM) dust guidance, a risk-based assessment has been undertaken for the development, using the well-established source-pathway-receptor approach.

6.8.5 The dust impact (the change in dust levels attributable to the development activity) at a particular receptor will depend on the magnitude of the dust source and the effectiveness of the pathway (i.e. the route through the air) from source to receptor.

6.8.6 The effects of the dust are the results of these changes in dust levels on the exposed receptors, for example annoyance or adverse health effects. The effect experienced for a given exposure depends on the sensitivity of the particular receptor to dust. An assessment of the overall dust effect for the area as a whole has been made using professional judgement taking into account the dust emission magnitude and the sensitivity of the area.

Current Baseline Environment

6.8.7 The baseline conditions for this report have been characterised by drawing on information from Defra Maps (Defra, 2018) and published results of local authority Review and Assessment studies of air quality.

6.8.8 The background annual-mean particulate matter with a diameter less than 10 µm (PM_{10}) concentration used in this assessment has been derived from the highest concentration of 17.9 $\mu g.m^{-3}$ predicted by Defra for the 1 km grid squares through which the site passes. This concentration is low and is less than half of the air quality limit value of 40 $\mu g.m^{-3}$ as set out in the UKs Air Quality Standards Regulations 2010.

Mitigation Measures

6.8.9 Several measures are proposed as part of the Project to mitigate the potential impacts on air quality during construction and operation. These include:

- The preparation and implementation of a Dust Management Plan (which would be approved by the Local Authority), which would contain measures to reduce the potential impact of dust generated during construction, such as water spraying, covering of dusty materials and speed limits on site;
- Measures relating to site preparation and management (e.g. planning the site so machinery and dust causing activities are located away from receptors;
- Undertake daily on-site and off-site inspection, where receptors (including roads) are nearby, to monitor dust, record inspection results, and make the log available to the local authority when asked; and
- Agree dust deposition, dust flux, or real-time PM_{10} continuous monitoring locations with the Local Authority.

Potential Likely Significant Effects

6.8.10 During construction, the key pollutant is dust, covering both the particulate matter fraction that is suspended in the air that can be breathed, and the deposited dust that has fallen out of the air onto surfaces and which can potentially cause temporary annoyance effects. Property, human-health and vegetation (ecological receptors) are all potentially affected.

6.8.11 The following potential impacts were identified with respect to air quality during the construction phase of the Project:

- dust impact risk of dust soiling on property arising from onsite activities;
- dust impact risk of increased suspended particulate matter on people arising from onsite activities; and
- dust impact risk of dust soiling and increased suspended particulate matter on ecology arising from onsite activities.

6.8.12 Taking the site as a whole, the overall risk of impacts on receptors from dust from earthworks, construction and track-out activities is deemed to be high without the implementation of appropriate mitigation measure.

6.8.13 However, following the implementation of appropriate dust control measures which are based on the IAQM Guidance on the assessment of dust from demolition and construction (IAQM, 2023), no significant effects are likely to occur with respect to air quality during construction of the Project.

6.8.14 Cumulative dust effects are only likely to be significant for any sensitive receptors that are located within 350m of both this construction activity and another dust-emitting activity being carried out at the same time. No cumulative developments have been identified within 700m of the site boundary and therefore no significant impacts identified.

6.8.15 It is considered that there are no significant transboundary effects likely to occur during the construction and operational phases upon the interests of other states with respect to air quality.

6.9 Glint and Glare

Introduction

6.9.1 This section presents a summary of the assessment of the likely significant effects on glint and glare due to the Project.

6.9.2 Glint and glare refers to solar reflections produced by the solar panels, and this assessment considers the operational phase of the development, as it is considered that this phase will produce the greatest potential effects.

Assessment Methodology

6.9.3 The effects of glint and glare are assessed with reference to aviation safety, railway operations, road safety and residential amenity. Receptors for assessment are identified within a 10km area of the solar panels for aviation

infrastructure, a 1km area for roads and dwellings, and a 500m area for railway receptors.

6.9.4 These assessment areas are based upon Glint and Glare Guidance and is in line with industry best practice. This guidance was developed by Pager Power following consultation with relevant stakeholders and with reference to existing guidance and solar reflectivity studies. Pager Power is an industry-leading specialist in this area.

6.9.5 A desk-based assessment is undertaken using geometric modelling to determine whether solar reflections are possible towards the identified receptors. These results are then compared against the impact significance criteria for the receptor type and an impact is assigned with reference to any mitigating factors.

Current Baseline Environment

6.9.6 The baseline environment is such that no significant glint and glare is considered possible from the site.

Mitigation Measures

6.9.7 Specific mitigation has been recommended for a small number of receptors. At all of these sites, it is considered that screening in the form of vegetation would be a suitable mitigation measure to prevent significant impacts towards the identified receptors.

Potential Likely Significant Effects

6.9.8 Glint and glare can lead to significant effects with regard to safety and amenity, depending on the receptor type. The potential effects identified (prior to mitigation) were with relation to road safety and residential amenity at various locations surrounding the site.

6.9.9 Based on the assessments, it is concluded that following mitigation, there will be no significant effects arising from the Project.

6.9.10 No cumulative impacts have been assessed with regard to glint and glare, as it is not considered likely that this development will cause additional significant impacts towards the receptors assessed when considering existing or proposed solar farms in the surrounding area.

6.9.11 A screening of transboundary impacts has been carried out and has identified that there was no potential for significant transboundary effects with regard to glint and glare.

6.10 Climate Change

Introduction

6.10.1 The potential impact of greenhouse gas (GHG) emissions caused directly or indirectly by the Project, resulting in an effect on the global atmospheric GHG concentration that contributes to climate change, has been assessed and reported in this section.

Assessment Methodology

6.10.2 The assessment considered the resilience of the design, construction and operation and maintenance of the Project to projected future climate change impacts.

6.10.3 GHG emissions have been estimated by applying published factors to activities in the baseline and to those required for the Project. The emissions factors relate to a given level of activity, or amount of fuel, energy or materials used, to the mass of GHGs released as a consequence.

6.10.4 The assessment has considered (a) the GHG emissions arising from the Project, (b) any GHG emissions that it displaces or avoids, compared to the current or future baseline, and hence (c) the net impact on climate change due to these changes in GHG emissions overall.

6.10.5 Effects which are not considered likely to be significant have been scoped out of the assessment. These include risks to the Project from climate change risks, increased ambient temperatures, extreme weather events, flood risks, land use changes and from the decommissioning phase.

Current Baseline Environment

6.10.6 With regard to current GHG emissions, the current baseline for the Project site is agricultural land, comprised of a series of agricultural fields of varying sizes. They are primarily used for pasture grazing and arable farming. This land is unlikely to have high soil or vegetation carbon stocks (e.g. peat) that would be subject to disturbance by construction.

Mitigation Measures

6.10.7 As a renewable energy development, climate change mitigation is an inherent aim of the Project. In order to ensure maximum energy yield, and therefore maximum GHG emissions displacement, the solar array would be south facing, and rows of panels would be distanced between 3 and 6 m apart from one another so as to avoid inter-panel shading.

6.10.8 Other mitigation measures include, where practicable, the use of pre-fabricated materials, locally sourced construction materials, minimised waste generation and adherence to Outline Code of Construction Practice.

Potential Likely Significant Effects

6.10.9 The construction-stage impact due to the extraction of raw materials, manufacturing and transportation of the panels, substations and associated electrical components have been assessed. The GHG impacts were calculated to be approximately 1,903,605 tCO_2e, causing an adverse effect that is significant. However, as the purpose of the Project is to provide a source of renewable energy, the construction-stage effects must be considered together with the long-term operational effect in order to determine the overall lifetime effect of the Project.

6.10.10 GHG effects from the construction-stage can be minimised via engagement with the supply chain and procurement decisions that consider GHG emissions

performance as documented through Environmental Product Declarations, in order to ensure that the solar panel modules and associated components selected are those manufactured under conditions with minimised GHG impacts.

6.10.11 GHG effects from the operational phase, due to the generation of zero-carbon electricity and consequent displacement of marginal sources of generation that would be providing energy in the absence of the Project and which would have greater GHG impacts, have been assessed. The magnitude of avoided GHG emissions from the operational phase are expected to be between -617,826 to -5,655,662 tCO_2e over the Project's lifetime compared to a current business-as-usual baseline and projected future energy baseline across the development's 31 year operational lifespan (under the current grid average scenario). The operational GHG impact of the Project has been determined to have a significant beneficial effect.

6.10.12 The whole-life impact of the Project has been determined to have a beneficial effect that is significant when comparing to current UK electricity grid factors. Although a significant initial carbon cost of manufacturing and installation is incurred, by achieving a carbon payback period of 10 years (earliest estimated payback period) and providing subsequent net negative emissions in operation, the Project meets policy goals for the rate of carbon reduction in the context of UK carbon budgets.

6.10.13 Cumulative effects due to other specific local development projects cannot be individually identified and assessed. Therefore, no relevant cumulative effects assessment has been completed for the climate change topic. This approach is consistent with the IEMA (2022) GHG in EIA Guidance.

6.10.14 A screening of transboundary impacts has been carried out and has identified that there was no potential for significant transboundary effects.

6.11 Socio Economics

Introduction

6.11.1 The socioeconomic assessment considers the interaction of social and economic factors such as income, education, and employment of the local and regional area and the impact on this that the Project is likely to have. It also assesses any potential tourism impacts of the Project on the population and is informed by the following other environmental topics:

- Landscape and Visual Resources;
- Noise & Vibration;
- Traffic and Transport;
- Human Health;
- Agricultural Land Use & Public Rights of Way; and
- Historic Environment.

6.11.2 The assessment also draws upon information contained within the socio-economic baseline report which includes an assessment of commuting

patterns and travel to work areas and has been used to the define the study area for this assessment. This includes the Local Authority areas of Cherwell District Council, West Oxfordshire District Council, Vale of White Horse District Council, South Oxfordshire and Oxford City.

6.11.3 The socio-economic indicators considered within the assessment include population, demographics, employment, health, travel to work patterns, access to renewable energy, deprivation, tourism and recreation.

Assessment Methodology

6.11.4 The significance of an effect is determined based on the sensitivity of a receptor and the magnitude of an impact. The approach to determining the significance of effects is a two-stage process that involves defining the magnitude of the impact and the sensitivity of the receptor.

Current Baseline Environment

6.11.5 The baseline assessment found that population growth (between 2011 and 2021) has been significantly higher in the study area (12.7%) compared to the South East region as a whole (7.5%). Also of interest is the fact that the working age population in the study area has declined by 1.8% compared to the 2011 Census results.

6.11.6 When looking at employment sectors across Oxfordshire we can see that agriculture only accounted for 1.1% of all employment with circa 4,360 people employed in the industry. Compared to 2018, the sector has lost circa 6.4% of its employees. In contrast construction employment has increased by circa 6.6% across Oxfordshire over this period and accounts for 6.3% of all jobs.

Mitigation Measures

6.11.7 The Project provides for a number of socioeconomic mitigation measures which will help avoid, reduce or offset likely adverse socioeconomic impacts and enhance any likely beneficial socioeconomic effects of the Project. The measures which are to be adopted as part of the Project are;

- Development of a community employment plan to promote working with local education and training providers to support local adult learning for job opportunities linked to the Project;
- As far as reasonably practicable (e.g. subject to standards and security checks) provide a targeted scheme of access to construction, operation and maintenance and decommissioning training schemes and apprenticeships for young people in the local and regional area who are Not in Education, Employment, or Training (NEET);
- Engage in the ethical procurement of the supply chain secured through the development of a Supply Chain Plan; An ethical supply chain operates in a way that delivers the highest levels of ethical and sustainable operations. This spans three key elements – economic, environment and social responsibility.

- Advertise lane closures in advance so road users are forewarned and can manage commute to work effectively;
- Provide space for at least two community agriculture groups to operate on the Project site, including on behalf of Cutteslowe Larder and Cherwell Collective,by means of an Agricultural Licence Agreement;
- Make retained and new routes through the arrays appealing to people to encourage their use by providing information boards (with details of new routes); benches and resting places; wildflowers and hedgerows (for visual screening); children's fun trails and education boards (e.g., on wildlife, heritage and solar energy) and landscape masterplan.
- Carry out construction works which have biggest noise and visual impact during the off-season for tourism so as to limit any impact upon local accommodation providers; and
- Ensure suitable pedestrian access is maintained for diversions of any temporary route closures and provide appropriate wayfinding information for temporary diversions during construction and decommissioning, such as being advertised online and signposting, including approximate journey times on the routes.

Potential Likely Significant Effects

6.11.8 The significance of the Project's effect upon the identified socioeconomic receptors has been determined by taking into account the sensitivity of the receptor and the magnitude of the impact.

6.11.9 The effects associated with providing employment opportunities as part of the Project were assessed during all phases of development (construction, operation and maintenance and decommissioning). The employment generation associated with each phase of works was independently assessed with all phases considered to have a beneficial impact.

6.11.10 All other potential effects associated with key receptors were assessed as being not significant with the exception of the potential impact on the visitor economy during construction which has been assessed as adverse. This is, however, based on the information currently available and this aspect will be further assessed in the ES based on additional survey work which is currently being carried out.

6.11.11 Cumulative impacts with respect to socio economics will be assessed and reported in the ES.

6.11.12 A screening of transboundary impacts has been carried out and has identified that there was no potential for significant transboundary effects.

6.12 Human Health

Introduction

6.12.1 Population health refers to the health outcomes of a group of individuals, including the distribution of such outcomes within the group. Population health varies, given factors such as personal choice, location, mobility and exposure.

These factors that influence health are called determinants of health and span environmental, social, behavioural, economic and institutional aspects. The Project has the potential to change determinants of health, with beneficial and adverse effects, either directly, indirectly or cumulatively.

Assessment Methodology

6.12.2 The assessment follows best practice to assess human health as part of environmental impact assessment (EIA). The methods follow the health in EIA guidance set out by the Institute of Environmental Management and Assessment (IEMA). The assessment provides reasoned conclusions for the identification and assessment of any likely significant effects of the Project on population health. Physical health, mental health and health inequalities are considered across a broad range of determinants of health.

6.12.3 The health assessment looks at the potential effects for both the general population and for vulnerable groups. Vulnerability relates to experiencing effects differently due to age, income level, health status, degree of social disadvantage or the ability to access services or resources. The health assessment considers localised population effects and also considers wider population effects at the regional and national and international levels.

6.12.4 The health assessment is informed by the findings of other PEIR topics, including agricultural land use and soils, traffic and transport, landscape and visual resources; socio-economic, climate change, air quality, and noise and vibration. The health assessment has also been informed by a review of relevant public health evidence sources, including scientific literature, baseline data, health policy, local health priorities and health protection standards.

Current Baseline Environment

6.12.5 An overall baseline health profile was gathered for relevant local authorities and wards in Oxfordshire, using regional (South-East) and national (England) data as comparators.

6.12.6 Data was gathered from publicly available public health evidence sources. This data shows that overall, physical health indicators (e.g. heart health, respiratory health), lifestyle indicators (e.g. diet, childhood obesity) and socio-economic indicators (e.g. income, education levels, employment) perform better in the local study area compared to national averages.

6.12.7 However, some indicators such as certain mental health indicators (e.g. depression), mortality related to air pollution, levels of physical activity and adult obesity perform worse than national levels. The health assessment has regard to such higher sensitivity.

Mitigation Measures

6.12.8 The health assessment is informed by the findings of other PEIR topics including the mitigation measures proposed within each topics.

6.12.9 In addition, the health assessment sets out some further measures to reduce the potential for adverse effects and increase the potential for beneficial effects. Measures include:

- Provide space and seed funding from a Community Benefit Fund for a community growing scheme.
- Make retained and new routes through the arrays appealing and inclusive in their access, so as to promote walking and cycling.
- Early and ongoing information sharing, including with emergency services, to minimise road disruption to healthcare journeys.
- Provide a targeted scheme of access to training schemes and employment opportunities for young adults.

6.12.10 The Applicant is also actively exploring opportunities for the Project to directly reduce the energy bills of residents living in the vicinity of the project. For example, a potential mechanism could be to establish a retail electricity supply company to sell Botley West's output to consumers. All power would be from renewable sources, and those living within the vicinity of the project the solar arrays would pay a reduced rate for electricity.

Potential Likely Significant Effects

6.12.11 A number of potential impacts on human health associated with the construction, operational and maintenance, and decommissioning phases of the Project, were identified. These included access to open space, leisure and play; transport modes, access and connections; community identity, culture and resilience; education and employment opportunities; environmental conditions; climate change; and wider societal infrastructure. With the measures adopted as part of the Project in place, the majority of these impacts result in adverse effects but are not significant. There are also several beneficial effects on human health that have been identified.

6.12.12 Construction and decommissioning of the Project has the potential to result in temporary and short-term disruption of public open spaces and public rights of way, affecting recreational activities for local people. This effect is assessed as being not significant.

6.12.13 During operation, while the Project will still have a very slight adverse impact on existing active travel routes, it will also be enhancing existing footpaths and providing new recreational routes, resulting in beneficial significant effects on population health.

6.12.14 During operation, the Project will be generating renewable energy, reducing greenhouse gases and supporting climate change adaptation, thereby resulting in significant population health benefits associated with energy security and climate change mitigation.

6.12.15 Operation of the Project has the potential to result in community concerns related to electrical infrastructure, and associated effects on mental health and wellbeing. Public understanding of risk will be addressed through continued communication and reassurance that actual risks are mitigated through design and adherence to relevant guidelines and the government voluntary code of practice on electromagnetic fields. The resultant effect is assessed to be not significant.

6.12.16 With respect to cumulative effects, there are no significant cumulative effects from the Project alongside other projects/plans.

6.12.17 No transboundary effects with regard to population health from the Project on the interests of other States were predicted.

6.13 Agricultural Land Use and Public Rights of Way

Introduction

6.13.1 This section presents a summary of the assessment of likely significant effects on agricultural land and public rights of way during construction, operation and decommissioning of the Project. The assessment considered the potential impacts on agricultural land quality, land holdings and public rights of way, including footpaths, bridleways and other promoted routes, such as National Cycle Routes and Long Distance Paths.

Assessment Methodology

6.13.2 Baseline agricultural land use and public rights of way were established using a detailed review of existing studies and datasets. In addition, soil surveys were undertaken to determine the quality and characteristics of agricultural land within the Project site. However, some areas within the Project site were not subject to soil surveys, due to dry soils or crop conditions.

Current Baseline Environment

6.13.3 The soil surveys determined that the Project site predominantly comprised Agricultural Land Classification (ALC) Grade 3a (good quality) and Grade 3b (lower quality) agricultural land and four land holdings. ALC Grade 3a agricultural land is categorised as best and most versatile land, and considered the most capable of delivering crops for food and non-food uses.

6.13.4 Desk based analysis identified the following public rights of way, which intersect the Project site: National Cycle Route 5; Oxford Greenbelt Way Long Distance Path; Shakespeare Way Long Distance Path; and several public footpaths and bridleways.

Mitigation Measures

6.13.5 Several mitigation measures are intended to be included as part of the Project to mitigate potential impacts on agricultural land and public rights of way:

- A Public Rights of Way Management Plan (PRoWMP) will be developed in accordance with the Outline PRoWMP, which is to be submitted alongside the ES. The Outline PRoWMP will include measures to avoid severance and maintain access to affected public rights of way and other promoted routes during construction of the Project.
- A CoCP will be developed in accordance with the Outline CoCP, which is to be submitted alongside the ES. The Outline CoCP will include measures to maintain access to affected land holdings during construction of the

Project and ensure that affected public rights of way are reinstated post-construction.

- A Soil Management Plan (SMP) will be developed in accordance with the Outline SMP, which is to be submitted alongside the ES. The Outline SMP will contain measures to maintain the quality of affected agricultural soils, including the requirement to reinstate land (as near as possible) to its former condition post-construction.

Potential Likely Significant Effects

6.13.6 Taking into account the mitigation measures described above, the following significant effects are likely to occur with respect to agricultural land and public rights of way:

- Temporary adverse effect on public rights of way, including footpaths and bridleways arising from disruption and reduced access during construction of the Project.

6.13.7 The following significant cumulative effects are likely to occur with respect to agricultural land and public rights of way:

- Permanent adverse cumulative effect as a result of the permanent loss of Best and Most Versatile agricultural land during construction of the Project and other projects/plans; and
- Temporary adverse cumulative effect on public rights of way, including footpaths and bridleways arising from disruption and reduced access during construction of the Project and other projects/plans.

6.13.8 No transboundary effects with regard to Agricultural Land Use and Public Rights of Way from the Project on the interests of other States were predicted.

6.14 Noise and Vibration

Introduction

6.14.1 This section presents a summary of the assessment of the likely significant effects on noise and vibration during construction, operation and maintenance and decommissioning phases of the Project. Unwanted noise and vibration can lead to adverse impacts on existing residential amenity and public health.

Assessment Methodology

6.14.2 The assessment considered noise and vibration effects due to all construction activities along the cable corridor during construction and decommissioning phases. This included noise effects due to;

- open-cut trenching;
- noise and vibration effects due to trenchless techniques at crossings (e.g. roads, railway lines, rivers etc.);

- noise and vibration effects due to the construction and decommission of the Solar photovoltaic array (PV) areas and associated plant such as transformers and substations, and
- noise effects due to construction traffic on local highway networks.

6.14.3 The assessment also considered noise effects due to the plant and equipment associated with the project site such as noise effects from the Power Conversion Systems (PCS) and noise effects from the secondary, main and National Grid substations.

6.14.4 Information on sources of noise and vibration within the study area was collected through a detailed review of existing studies and datasets such as Ordnance Survey and Google earth imagery. Site-specific surveys were undertaken in May 2023 to inform the PEIR and included a series of long-term sound measurements undertaken at locations representative of the nearest noise-sensitive receptors to construction noise sources proposed as part of the Project.

6.14.5 The survey comprised long-term sound monitoring at 15 locations within the Project development area.

Current Baseline Environment

6.14.6 The existing sound environment area surrounding the Project site was characterised via site-specific surveys where long-term noise monitoring provided data for the determination of impact assessment criteria.

6.14.7 The long-term sound survey highlights that much of the area surrounding the Project site has a fairly low existing noise climate due to the rural nature of certain areas. The dominant sources of noise were noted to be traffic on local highway networks.

Mitigation Measures

6.14.8 The Project provides for a number of noise and vibration mitigation measures which will help avoid, reduce or offset likely adverse impacts. The measures which are to be adopted as part of the Project are;

- The orientation and layout of the substations will be designed to minimise noise levels at nearby receptors;
- Quieter equipment will be selected, where available and practicable, and mitigation measures such as acoustic barriers and enclosures will be specified where necessary;
- The core working hours for the construction of the Project will be 07:00 – 19:00 hours Monday to Saturday;
- Noise limits to be implemented through the Operational Noise Management Plan to be secured as a requirement of the DCO;
- A Construction Noise and Vibration Management Plan (CNVMP) will be prepared as part of the CoCP. It will include measures to mitigate noise from construction activities associated with the Project. If required, this will

include a bespoke method statement for HDD (and other high-noise emitting works) undertaken close to noise-sensitive receptors;

- An Operational Noise Management Plan (ONMP) will be prepared. The Plan will identify the noise limits for the operation of the Project and the measures for how these limits would be monitored. It will be informed by a full assessment of operational noise to be undertaken once the plant design is complete.

Potential Likely Significant Effects

6.14.9 A number of potential noise and vibration impacts associated with the construction, operational and maintenance, and decommissioning phases of the Project were identified. These included noise and vibration impacts arising from the construction of the Project and operational noise impacts due to the equipment required. Adopting the measures proposed as part of this project, the majority of these impacts will result in effects being not significant.

6.14.10 Effects of significant adverse effects have been identified where trenchless techniques are required to install the transmission cables and due to the construction of the substation sites. This is due to the high noise levels associated construction plant, as well as the potential need for night-time working for HDD where existing noise levels are low. The significance of this effect may be reduced by using quieter equipment, limiting night-time working where possible, and adopting mitigation measures for the construction plant items, where available. Providing such measures are adopted, it is possible the significance of this effect may be reduced to being not significant.

6.14.11 Cumulative effects from nearby noise-generating developments (construction or operational) were assessed and were not significant.

6.14.12 No transboundary effects with regard to noise and vibration from the Project on the interests of other States were predicted.

6.15 Waste and Resources

Introduction

6.15.1 This section presents the preliminary findings relating to waste and resources. The design of the Project is at a stage where the key waste streams and resource requirements cannot be confirmed to an acceptable degree of certainty. For this reason, assessment of the potential impacts of the Project with regards to waste and resources is not included in the PEIR. The impact assessment will be undertaken in the ES when the necessary design information is available.

Assessment Methodology

6.15.2 The scope of the assessment will consider the types and volumes of wastes that will be generated during the construction, operation and maintenance and decommissioning phases of the Project; and the impact on the existing waste management infrastructure. The assessment will also consider the consumption of materials during the construction of the Project.

6.15.3 The scope follows guidance documents relevant to waste management and published by UK Government and leading institutions such as Department for Environment, Food & Rural Affairs (DEFRA), Environment Agency, Building Research Establishment (BRE), Greater London Authority and Waste & Resources Action Programme (WRAP).

6.15.4 The assessment will focus on the effects of the Project on the depletion of resources (specifically key resources during construction) and the depletion of landfill capacity during construction and operation and decommissioning. The operation of the Project is not envisaged to involve the use of many resources.

6.15.5 Information on the current and permitted landfill capacity and resource availability is taken from the 2020 AMR (Oxfordshire County Council, 2023). A future baseline for landfill capacity will be developed in discussion with Oxfordshire County Council where required.

Current Baseline Environment

6.15.6 The Oxfordshire Minerals and Waste Local Plan: Part 1 – Core Strategy (Oxfordshire County Council,2017) (Core Strategy) provides the framework for monitoring policies that control waste management in Oxfordshire for the plan period up to 2031.

6.15.7 A new Minerals and Waste Plan for Oxfordshire is currently in preparation and once adopted, it will replace the Core Strategy (2017). Initial consultation on the Issues and Options for the Plan concluded in September 2023 and the new Minerals and Waste Plan is expected to be adopted in March 2026. The Authority Monitoring Report (AMR) 2020 (Oxfordshire County Council, 2023) estimates have been used to determine baseline and understand the total tonnes of construction, demolition and excavation (CDE) waste generated in Oxfordshire in 2020.

Mitigation Measures

6.15.8 Following statutory consultation, the Project design will be refined with the overarching principle of achieving efficiencies in waste and resources where possible. Measures to design out waste and implement the waste hierarchy will include the sizing of construction compounds to enable segregation and storage of waste. The design of the Project will ensure adequate provision for internal and external waste storage to allow waste segregation during operation and maintenance.

6.15.9 A Site Waste and Resources Management Plan (SWRMP) will be prepared that sets out the estimated types and quantities of waste that would be generated during all phases of the Project, together with measures for how the waste will be managed. The SWRMP will be based on the waste hierarchy and proximity principles for managing waste generated by the Project including targets to divert waste from landfill. The SWRMP will also identify the key resources that will be used in the construction of the Project and commitments for using secondary/recycled content materials where feasible.

Potential Likely Significant Effects

6.15.10 As stated earlier the detailed impact assessment will be undertaken in the ES when the necessary design information relevant to waste and resources is available. However, in the absence of design information relating to the generation of waste and the use of resources, an indicative assessment was carried out to provide a broad indication as to the potential for significant effects. This is based upon the baseline conditions, assessments for other similar developments and professional judgement.

6.15.11 The construction, operation and decommissioning of the Project has the potential to lead to significant effects with regards to the reduction of landfill capacity and depletion of resources. However, the Project has committed to minimising waste through design and the efficient use of resources and to implement a waste and resources management plan that would follow the waste hierarchy principle in the management of wastes. These measures together with the wide network of existing landfill sites and waste management facilities within Oxfordshire indicate that the potential effects are unlikely to be significant.

7 Further Information and Next Steps

7.1 Further Information

7.1.1 Digital copies of the full Preliminary Environmental Information Report(PEIR), including this Non-Technical Summary can be viewed at: Botley West Solar Farm | National Infrastructure Planning (planninginspectorate.gov.uk). The

PEIR has three volumes, Volume 1: Main Text, PEIR Volume 2: Figures and PEIR Volume 3: Appendices.

7.1.2 Electronic copies of the PEIR (on CD) or hard copies can be purchased by getting in touch with the team using the email below. Please note copying, printing and administrative charges will be made to cover the cost (including postage and packaging).

7.1.3 Address for communication is info@botleywest.co.uk and the freephone is 08081753085.

7.2 Next Steps

7.2.1 This Non-Technical Summary provides a summary of the PEIR that forms part of the preapplication consultation for the Project.

7.2.2 The PEIR has been published as part of the consultation process, which also includes a series of community consultation events in accordance with the process set out in the Statement of Community Consultation (SoCC).

7.2.3 Following consultation on the PEIR, all consultation responses received will be reviewed and taken into account in the ongoing EIA and Project design processes and, ultimately, the production of the final Environmental Statement (ES) to be submitted with the application for development consent.

8 References

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HM Government Legislation. Planning Act, 2008 (as amended).

IAQM (2023) Guidance on the assessment of dust from demolition and construction

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West Oxfordshire District Council (2018) Local Plan 2031, adopted in 2018.

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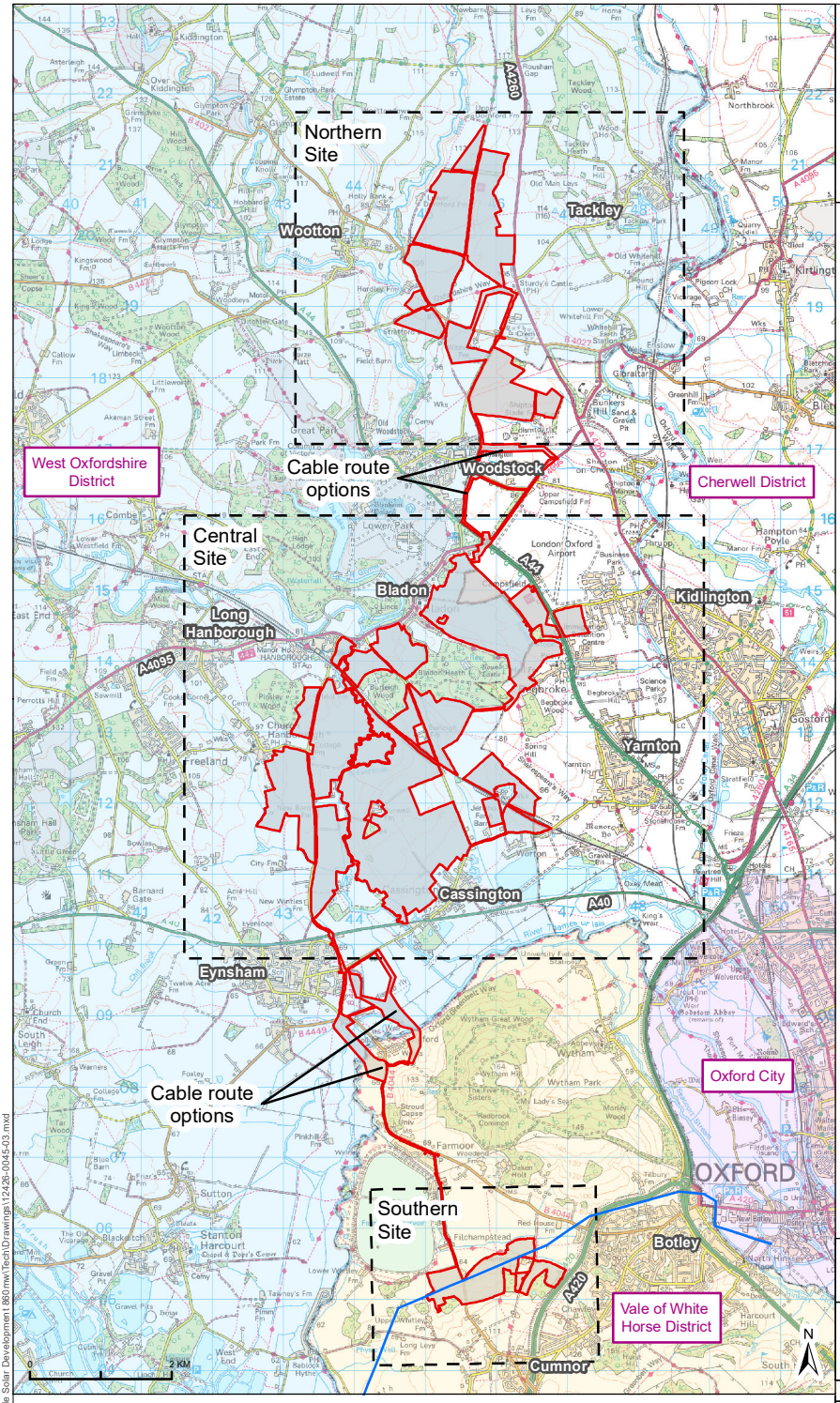
FIGURES



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LEGEND

- Project Site Boundary
- 400kv Overhead Line

Local Planning Authorities

- Cherwell District
- Oxford City
- Vale of White Horse District
- West Oxfordshire District

PHOTOVOLT DEVELOPMENT PARTNERS

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Figure Number	Rev
1	-

VER	DATE	DETAILS	BY	CHECK

Client	PVDP	Status	Drawn By	PM/Checked By
Project	Botley West Solar Farm	Final	JM	MB
Title	Site Location Plan	Project Number NP12426	Scale @ A3 1:100,000	Date Created OCT 2023

rpsgroup.com
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T: +44(0)1235 821 888 E: rpsox@rpsgroup.com

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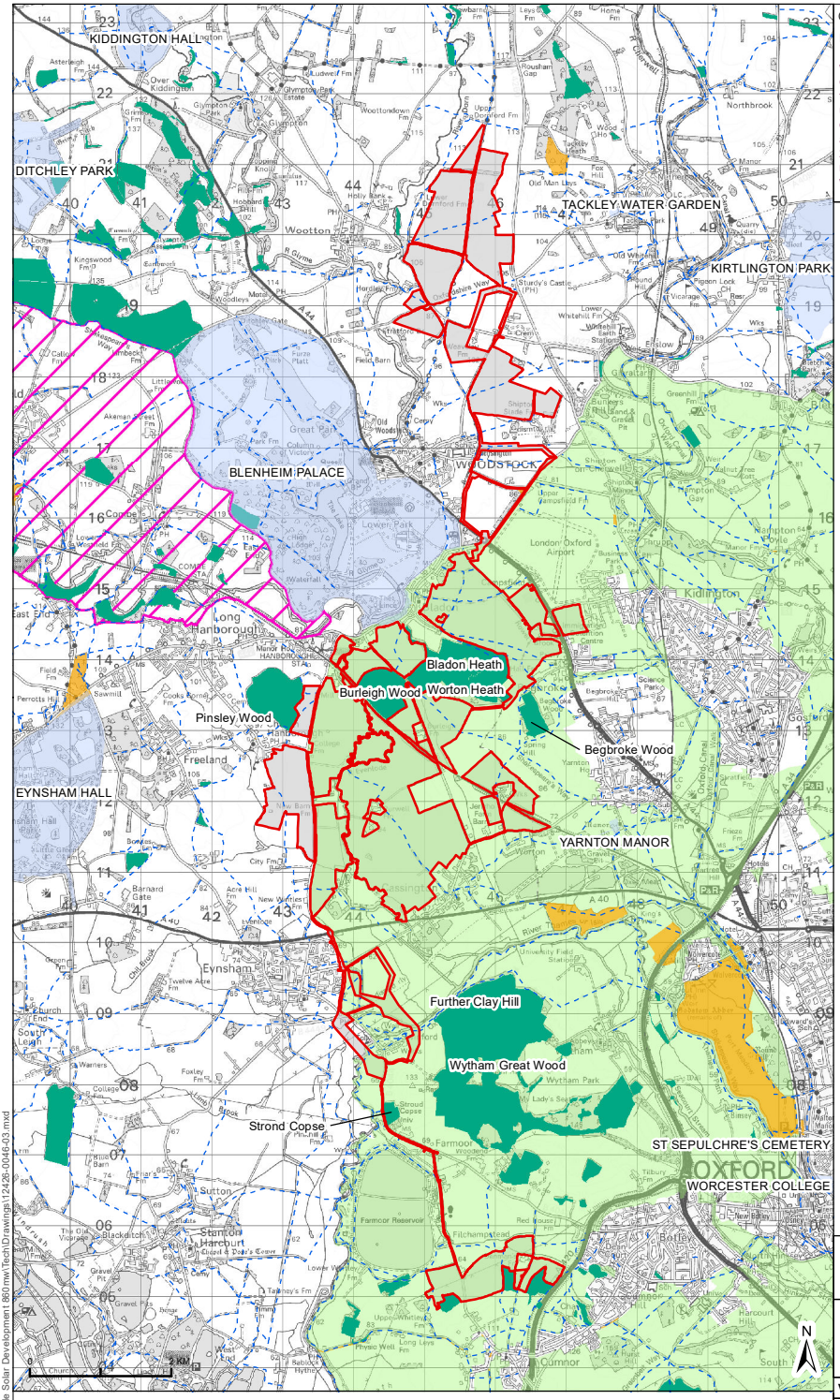

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LEGEND

- Project Site Boundary
- Green Belt
- Parks and Gardens
- CRoW Access Land
- Ancient Woodland
- Area of Outstanding Natural Beauty
- Public Right of Way

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Figure Number: 2

Rev: -

VER	DATE	DETAILS	BY	CHECK

Client	PVDP
Project	Botley West Solar Farm
Title	Landscape Designations and Green Belt

Status	Drawn By	PM/Checked By
Final	JM	MB
Project Number	**Scale @ A3**	**Date Created**
NP12426	1:100,000	OCT 2023

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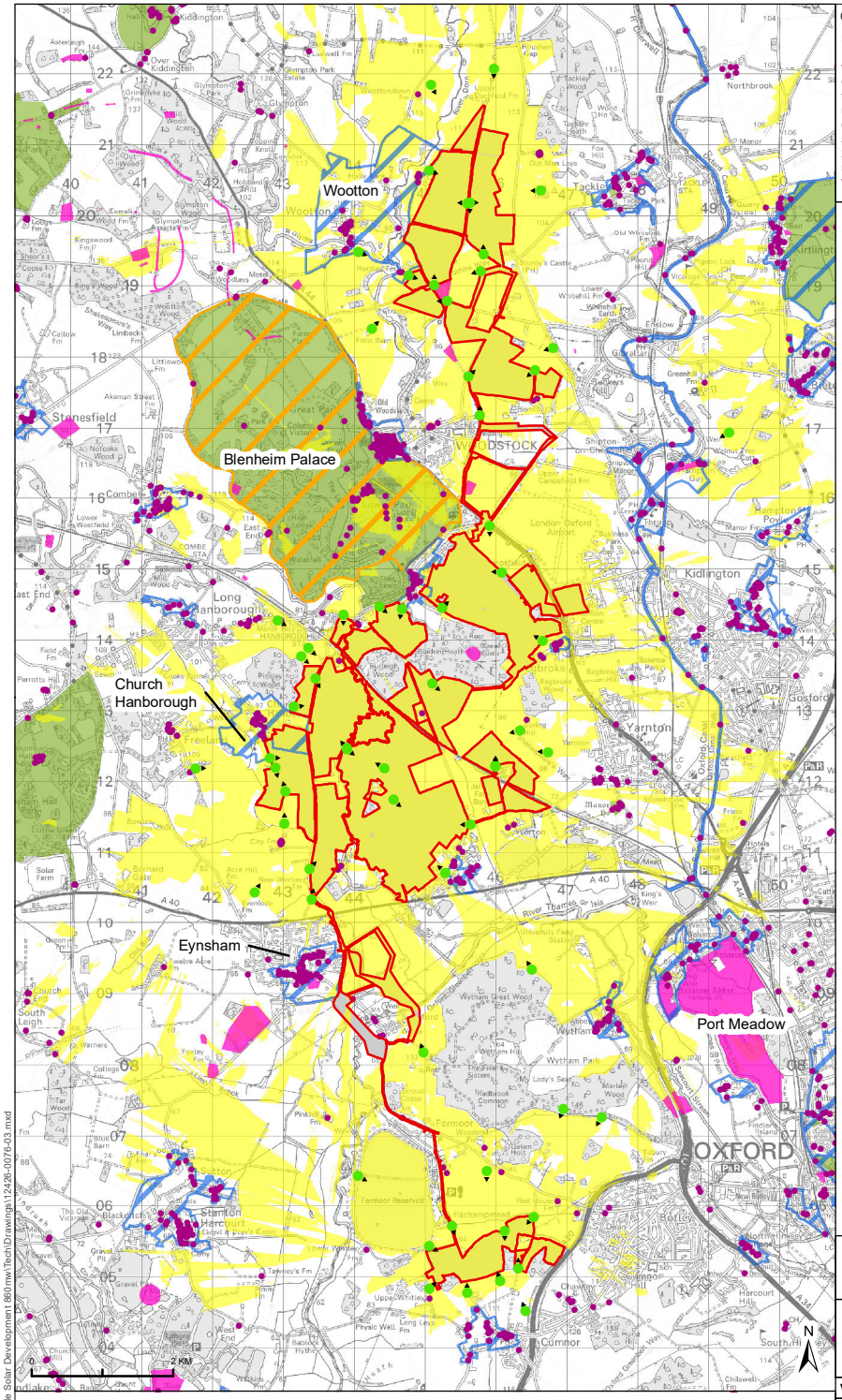

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LEGEND

- Project Site Boundary
- Representative Viewpoints
- Zone of Theoretical Visibility
- Listed Building
- Conservation Area
- World Heritage Site
- Scheduled Monument
- Parks and Gardens

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Figure Number: 3

Rev: -

VER	DATE	DETAILS	BY	CHECK

Client: PVDP

Project: Botley West Solar Farm

Title: Heritage Designations with Zone of Theoretical Visibility

Status	Drawn By	PM/Checked By
Final	JM	MB
Project Number	**Scale @ A3**	**Date Created**
NP12426	1:100,000	OCT 2023

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