WHITESTONE
solar farm

WHITESTONE SOLAR FARM

Volume 6: Environmental Statement

6.21 Non-Technical Summary

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Contents

1 INTRODUCTION 7
1.1 Background 7
1.2 Purpose 7
1.3 The Whitestone Solar Farm 7
1.4 The Applicant 8
1.5 The EIA Team 8

2 WHITESTONE SOLAR FARM OVERVIEW 9
2.1 Need for the Proposed Development 9
2.2 Location of the Proposed Development 10
2.3 Site Context 10
2.4 Components of the Proposed Development 14
2.5 Phases of the Proposed Development 19

3 ALTERNATIVES AND DESIGN EVOLUTION 21
3.1 Context 21
3.2 Alternative Renewable Technologies 21
3.3 The 'Do Nothing' Alternative 21
3.4 Selection of the Solar PV Area 22
3.5 Selection of the Cable Corridors 23
3.6 Design Evolution 23

4 ENVIRONMENTAL IMPACT ASSESSMENT PROCESS 25
4.1 What is an Environmental Impact Assessment (EIA)? 25
4.2 The EIA Process for the Proposed Development 26
4.3 EIA Methodology 27
4.4 Design and Mitigation Process 28
4.5 Environmental Management Plans 28

5 LIKELY SIGNIFICANT ENVIRONMENTAL EFFECTS 30
5.1 Introduction 30
5.2 Biodiversity and Nature Conservation 30
5.3 Landscape and Visual 35
5.4 Cultural Heritage and Archaeology 38
5.5 Ground Conditions and Land Quality 40
5.6 Water Resources and Flood Risk 43
5.7 Climate Change and Greenhouse Gas 45
5.8 Air Quality 48
5.9 Traffic and Transport 50
5.10 Noise and Vibration 52
5.11 Socioeconomics, Tourism and Recreation, and Land Use 54
5.12 Other Environmental Issues 57
5.13 Cumulative Effects 61

6 SUMMARY AND CONCLUSIONS 65

Tables

Table 4.1 Environmental Management Plans 29
Table 5.1 Summary of BMV land 41
Table 5.2 Summary of Inter Cumulative Effects 63

Figures (NTS Appendix 1)

Figure Number	Figure Title
1	Order Limits
2	Site Referencing
3	Detailed Site Referencing
4	Illustrative Masterplan
5	Public Rights of Way and Other Recreational Receptors
6	ALC Survey Results
7	Flood Zones
8	12km Search Area
9	Local Designated Sites
10	International and National Designated Sites
11	Representative Viewpoints – W1
12	Representative Viewpoints – W2
13	Representative Viewpoints – W3
14	Traffic and Transport Study Area
15	Noise Monitoring Locations – W1
16	Noise Monitoring Locations – W2
17	Noise Monitoring Locations – W3
18	Cumulative Effects Assessment – Zones of Influence

Appendices (See NTS Appendix)

Appendix Number	Appendix Title
1	Figures

Images

Image Number	Image
1	Typical Example of a Solar PV Array
2	Example of a PCS
3	Example of a BESS Unit
4	Example of a 400kV Substation

Plates

Plate Number	Plate
2.1	Potential Energy Production of the Proposed Development
3.1	Design Evolution Stages
4.1	Key Elements of the EIA Process
4.2	Pre-Application Activities Timeline

Glossary

Term	Meaning
Additional Mitigation	Further mitigation proposed to reduce a significant adverse effect where possible.
Cable Corridors	Corridors within which the high voltage cables would be constructed.
Draft ES	Draft Environmental Statement which presented the preliminary environmental information relating to the Proposed Development. The Draft ES was prepared to present information for statutory consultation in accordance with current EIA regulation.
Embedded Mitigation	Measures that are integrated into the design of the Proposed Development and are considered within the EIA
ES	Environmental Statement which presents the environmental information relating to the Proposed Development and assessment of potential effects. The ES has been prepared as part of the Application.
Long Lane 400kV Substation	The new 400 kilovolt National Grid substation proposed on land immediately east of Long Lane, Brinsworth, S60 4JJ.
Magnitude of impact	How big the change is, how long it lasts, and whether it can be reversed.
National Grid Brinsworth Substation	The existing 275 kilovolt substation at Brinsworth, located on Howarth Lane, Brinsworth, S60 5LW.
Order Limits	Total area comprising the Site and Cable Corridors.
Receptor	Things in the environment that could be affected by the Proposed Development. Receptors could be people, animals, habitats, designated sites or similar components of the environment.
Sensitivity of the Receptor	How vulnerable or valuable the affected feature is (e.g. a rare or protected species)
Significance of effect	Determined by evaluating sensitivity of the receptor and the magnitude of impact. Can be concluded as significant or not significant
Statutory Consultation	Statutory Consultation is a legally required process where developers must consult statutory bodies, local authorities, and the public about the environmental effects of a proposed project. It ensures that environmental considerations are integrated into planning decisions, particularly for major infrastructure developments.

Term	Meaning
Study Area	An area within which the potential effects of the Proposed Development are assessed. Depending on the topic, the Study Area can vary in size and can include land within and outside the Order Limits.
The Applicant	Whitestone Net Zero Ltd.
The Application	The Application to be submitted to the Secretary of State for a Development Consent Order.
The Proposed Development	The proposed Whitestone Solar Farm.
The Site	The land planned to be used for solar PV array and associated infrastructure, BESS, substations, and landscaping and habitat enhancement. The Site is split into W1, W2, and W3
Whitestone 1 (W1)	The northern parcels of the Whitestone Solar Farm.
Whitestone 2 (W2)	The middle parcels of the Whitestone Solar Farm.
Whitestone 3 (W3)	The southern parcels of the Whitestone Solar Farm.

Acronyms

Acronym	Meaning
ALC	Agricultural Land Classification
AQMA	Air Quality Management Area
ATC	Automatic Traffic Counters
BESS	Battery Energy Storage System
BGS	British Geological Survey
BMV	Best and Most Versatile
BNG	Biodiversity Net Gain
BSMP	Battery Storage Safety Management Plan
CCRRA	Climate Change Risk and Resilience Assessment
CCTV	Closed Circuit Television
CDC	City of Doncaster Council
CEMP	Construction Environmental Management Plan
CNP	Critical National Priority
CTMP	Construction Traffic Management Plan
DC	Direct Current
DCO	Development Consent Order
DEFRA	Department for Environment, Food, and Rural Affairs
DEMP	Decommissioning Environmental Management Plan
DMRB	Design Manual for Roads and Bridges
EA	Environment Agency
eDNA	Environmental DNA

Acronym	Meaning
EIA	Environmental Impact Assessment
EMF	Electromagnetic Fields
ERM	Environmental Resources Management Limited
ES	Environmental Statement
ESA	Environmental Site Assessment
GCN	Great Crested Newt
GHG	Greenhouse Gas
GVA	Gross Value Added
IAQM	Institute of Air Quality Management
ICCI	In-Combination Climate Impact Assessment
ISEP	Institute of Sustainability and Environmental Professionals
LCRM	Land Contamination Risk Management
LEMP	Landscape and Ecological Management Plan
LNR	Local Nature Reserve
LWS	Local Wildlife Site
NEDDC	North East Derbyshire District Council
NGR	National Grid Reference
NSIP	Nationally Significant Infrastructure Project
NTS	Non-Technical Summary
ONS	Office for National Statistics
oLEMP	Outline Landscape and Ecology Management Plan
OEMP	Operational Environmental Management Plan
PCS	Power Conversion Stations
PRoW	Public Rights of Way
PRoWMP	Public Rights of Way Management Plan
PV	Photovoltaic
RMBC	Rotherham Metropolitan Borough Council
SAC	Special Area of Conservation
SFRA	Strategic Flood Risk Assessment
SF6	Sulphur Hexafluoride
SMP	Soil Management Plan
SPA	Special Protection Area
SSSI	Site of Special Scientific Interest
SWDS	Surface Water Drainage Strategy
SWMP	Site Waste Management Plan
UKHab	UK Habitat Classification
WSI	Written Scheme of Investigations

Acronym	Meaning
W1	Whitestone 1
W2	Whitestone 2
W3	Whitestone 3
ZoI	Zone of Influence
ZTV	Zone of Theoretical Visibility

Units

Units	Meaning
CO_2e	Carbon Dioxide Equivalent
ha	Hectare
km	Kilometre
kV	Kilovolt
m	Metre
MW	Megawatt

1 INTRODUCTION

1.1 Background

1.1.1 Whitestone Net Zero Ltd (the Applicant) is planning to develop the Whitestone Solar Farm (the Proposed Development), together with associated infrastructure located to the east of Sheffield and Rotherham, South Yorkshire.

1.1.2 The Proposed Development will have the capacity to generate, store and export more than 100 megawatts (MW) of power. Therefore, it is considered a Nationally Significant Infrastructure Project (NSIP) under the Planning Act 2008 (the 2008 Act). Under the 2008 Act, a type of planning consent called a Development Consent Order (DCO) is required for NSIPs.

1.1.3 An Environmental Statement (ES), required as part of an Environmental Impact Assessment (EIA), has been produced to support the DCO Application. The ES provides environmental information to assess the likely significant human and environmental effects as a result of the construction, operation and maintenance, and decommissioning of the Proposed Development.

1.1.4 The DCO Application will be reviewed by an Examining Authority appointed by the Planning Inspectorate which oversees the Application and decision-making process for NSIPs, and a final decision will be made by the Secretary of State for Energy Security and Net Zero.

1.2 Purpose

1.2.1 This Non-Technical Summary (NTS) has been prepared on behalf of the Applicant, to summarise the ES and present key findings. For further detail, it is recommended that **NTS Appendix 1: Figures** is viewed alongside this NTS.

1.3 The Whitestone Solar Farm

1.3.1 The Proposed Development involves the construction, operation and maintenance, and decommissioning of solar photovoltaic (PV) modules and Battery Energy Storage System (BESS) facilities, across a total area of approximately 1,488 hectares (ha). It also includes on-site substations, supporting infrastructure, and associated infrastructure to connect to the National Grid.

1.3.2 The Applicant has a connection agreement to connect the Proposed Development into the new National Grid substation (Long Lane 400kV Substation). The construction of the Long Lane 400kV Substation is part of a National Grid proposal to upgrade the existing Brinsworth to Chesterfield and Chesterfield to High Marnham overhead electricity lines[i]. The Long Lane 400kV Substation is part of a separate planning application being progressed by National Grid and does not form part of the Proposed Development.

[i] Further information regarding National Grid's plans for upgrading the electricity network are available via the Substation Near Brinsworth Project Summary Document (May 2024). [Online] Available at: https://www.nationalgrid.com/document/355231/download. (Accessed: September 2025)

1.4 The Applicant

1.4.1 The Proposed Development is being promoted by Whitestone Net Zero Ltd which is a wholly-owned subsidiary of Net Zero One Ltd. Net Zero One Ltd is a specialist renewable energy development business founded in 2021 to establish a funding pipeline to build, operate and decommission the Proposed Development and other similar projects.

1.4.2 The Applicant is part of the Green Nation family of companies established in 2011, Green Nation is a UK-based solar developer and manager of operational sites with extensive experience in both rooftop and ground-mounted solar projects. Green Nation currently manages 75 solar farms and more than 700 rooftop installations across the country. Its solar farm portfolio totals over 200MW of electricity producing capacity for the UK.

1.5 The EIA Team

1.5.1 The delivery of the EIA for the Proposed Development is being led by Environmental Resources Management Limited (ERM) with support from other specialist organisations. ERM is a member of the Institute of Sustainability and Environmental Professionals (ISEP) EIA Quality Mark, a scheme that allows organisations to make a commitment to excellence in EIA activities and have this commitment independently reviewed.

2 WHITESTONE SOLAR FARM OVERVIEW

2.1 Need for the Proposed Development

The UK has committed to eliminating fossil fuels from the power supply, to provide energy security and reduce future energy costs while supporting the fight against climate change. Now that the last coal power station in the UK, Ratcliffe-on-Soar, has been closed down, new renewable energy sources are needed to come forward to keep the lights on. At the same time, our demand for electricity continues to increase and is projected to double by 2050. To meet these future energy needs, we must quickly ramp up production of renewable energy here in the UK. The Clean Power 2030 Action Plan[1] sets a goal to triple solar capacity by 2030, as well as ramp up onshore and offshore wind development. Solar and wind work well together, and a mix of both helps provide stability to the energy supply. The Solar Roadmap explains how the UK will achieve the Clean Power mission and includes new mechanisms to increase rooftop solar installations. From 2027, most new homes will be required to include solar panels, known as the Future Homes Standard. The Applicant supports the 'rooftop revolution' but notes that large scale solar developments are needed to produce enough energy to meet our national energy goals.

2.1.1 The Proposed Development has an agreement to supply 750MW of energy to the National Grid. The infographic **Plate 2.1** below helps explain the scale of that amount of energy.

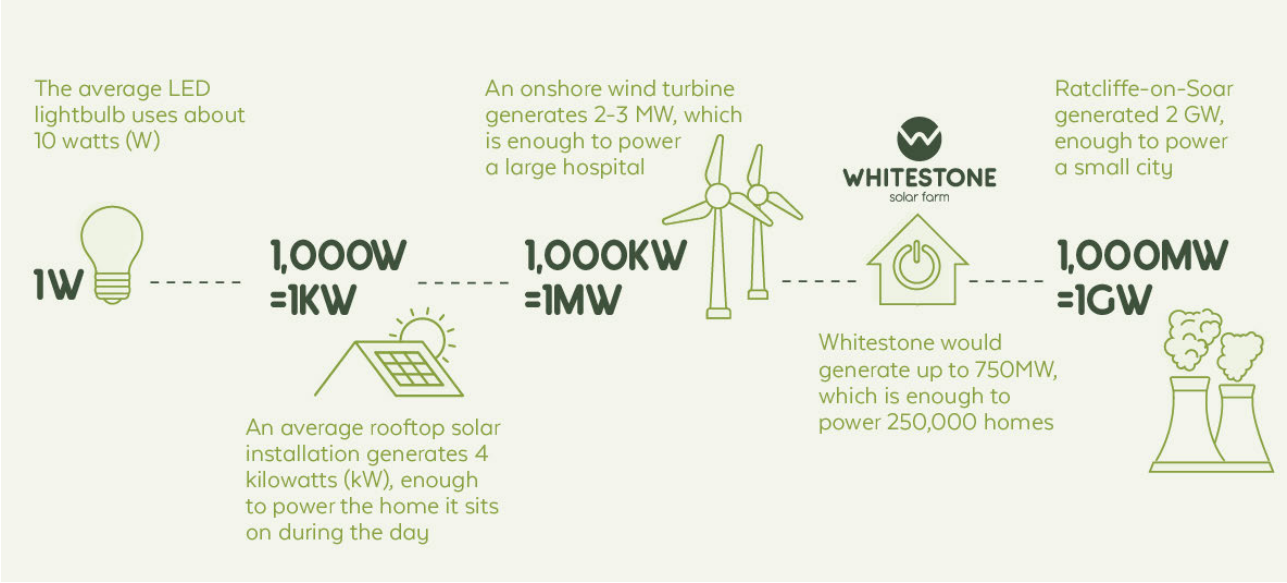


Plate 2.1 Potential Energy Production of the Proposed Development

2.2 Location of the Proposed Development

2.2.1 The boundary of the Proposed Development, known as the 'Order Limits' is the maximum area of land required for the construction, operation, maintenance and decommissioning of the Proposed Development. The Order Limits cover a total area of approximately 1,488ha. This includes 1,149ha for the Site and 339ha for the Cable Corridors.

2.2.2 The Order Limits are centred around National Grid Reference (NGR) SK 485887 as shown in **NTS Appendix 1, Figure 1: Order Limits**.

2.3 Site Context

2.3.1 The Site has been split into three areas. These areas are shown in **NTS Appendix 1, Figure 2: Site Referencing** and are referred to as:

- Whitestone 1 (W1) in the north near Conisbrough
- Whitestone 2 (W2) in the centre to the east of Brinsworth; and
- Whitestone 3 (W3) in the south near Harthill with Woodall.

2.3.2 Underground cables are needed to connect the solar areas to each other and into the National Grid. At this stage in the development process, the Applicant has identified Cable Corridors which are search areas within which a much narrower final cable would be located. There are in total 18 Cable Corridors within the Order Limits. Where two are listed within the same bullet point below, only one would be needed. These Cable Corridors are:

- Cable Route A to connect the east and west of W1, either side of the disused railway
- Cable Route B to connect W1 to W2
- Cable Route C to connect W2A to W2C
- Cable Routes D1 and D2 to connect W2 to the point of connection at Long Lane 400kV Substation (only one of these is necessary)
- Cable Route E to encompass all cabling works in and around Long Lane 400kV Substation
- Cable Route F to connect W2B and W2C
- Cable Routes G1 and G2 to interconnect W2B (only one of these is necessary)
- Cable Route H to connect W2C to W2D
- Cable Routes I1 and I2 to connect W2D and W2E (only one of these is necessary)
- Cable Route J to connect W2F to Cable Routes K1 and K2
- Cable Routes K1 and K2 to connect Cable Route J to W2G (only one of these is necessary)
- Cable Route L to connect W2 and W3
- Cable Route M to connect W3A to W3C; and
- Cable Route N to connect W3B to W3C.

2.3.3 The Cable Corridors are shown in **NTS Appendix 1, Figure 3: Detailed Site Referencing**.

2.3.4 W1, W2, and W3 comprise mostly open farmland with further detail about the characteristics of W1, W2 and W3 presented below.

W1

Overview

2.3.5 W1 covers 327ha of mainly agricultural land, mostly within CDC's jurisdiction, with a small portion in RMBC. It borders the M18 and the A630, forming a broad open landscape in a shallow bowl with gently rising terrain and small hills. The land consists of large arable fields with mixed hedgerow and tree boundaries, some of which are sparse. Residential properties are scattered along Firsby Lane and Arbour Lane, with more concentrated housing in Clifton and Conisbrough.

Landscape Designations

2.3.6 W1 lies within the South and West Yorkshire Green Belt but is not covered by statutory landscape designations. Several public footpaths and bridleways cross the Site, connecting various points including Park Lane and Clifton. PRoWs within the Order Limits and surrounding area are shown in **NTS Appendix 1, Figure 5: Public Rights of Way and Other Recreational Receptors**.

Ecology and Wildlife Sites

2.3.7 W1 is not located within any European Protected Sites, such as Special Protection Areas (SPAs) or Special Areas of Conservation (SACs). It also does not contain any statutory ecological designations, including Sites of Special Scientific Interest (SSSIs), Local Nature Reserves (LNRs), or Ramsar Sites. However, the Firsby Reservoir LNR lies immediately southwest of W1, and Thrybergh Country Park is approximately 1.3 kilometres (km) to the west.

Heritage and Archaeology

2.3.8 There are no designated heritage assets within W1. Heritage features near W1 include three Grade II Listed Buildings, five conservation areas, and two Scheduled Monuments, Conisbrough Castle, and a Romano-British Villa. The remains of a medieval pottery factory have also been recorded in the southwest of W1, at the southern end of Firsby Lane. Geophysical surveys have been conducted to understand buried archaeology within the Site. These surveys have identified a series of settlements and enclosures and multi period field systems.

Ground Conditions and Land Quality

2.3.9 Agricultural Land Classification (ALC) surveys have been undertaken on the Site. The ALC surveys indicate that the soil grade in W1 (where surveys have been completed) is predominantly ALC subgrade 3b (non-Best and Most Versatile (BMV)), with small areas in the north and west of Grades 1 and 2 and Subgrade 3a (BMV). 10.9% of W1 is classified as BMV following ALC surveys. ALC survey results are shown in **NTS Appendix 1, Figure 6: ALC Survey Results**.

Hydrology and Flood Risk

2.3.10 Kearsley Brook runs through W1. The Environment Agency's (EA) flood zones and historic flood mapping indicate that there is only a very small area (less than 1%) of Flood Zone 3 in the north of W1. Flood Zone 3 areas have a high probability of flooding (annual probability >1%). Flood Zones within W1 are shown in **NTS Appendix 1**, **Figure 7: Flood Zones**.

W2

Overview

2.3.11 W2 covers approximately 651ha of predominantly agricultural land in RMBC. It is bisected by the M1 and bordered by several towns and villages including Wickersley, Thurcroft, Dinnington, North Anston, Aston, Aughton, Treeton, and Brinsworth. The M1 and M18 motorways run through the centre, with their junction located to the north. An operational wind farm (Penny Hill Wind Farm), with six turbines, is located west of the M1 but is not part of the Proposed Development.

Landscape Designations

2.3.12 W2 lies within the South and West Yorkshire Green Belt but is not covered by statutory landscape designations. It features a broad open landscape with shallow valleys and bowls, though views are often contained by trees and hedgerows. Numerous public footpaths and bridleways cross the Site, connecting surrounding areas.

Ecology and Wildlife Sites

2.3.13 W2 is not located within any European Protected Sites. However, Brampton Common Local Wildlife Site overlaps its eastern edge. Nearby designated sites include Anston Stones Wood SSSI and LNR, Ulley Country Park LWS, and Catcliffe Flash LNR, all within 2km of W2.

Heritage and Archaeology

2.3.14 There are no designated assets within W2, but nearby heritage assets include 27 Grade II listed buildings, ten conservation areas, and five scheduled monuments.

Ground Conditions and Land Quality

2.3.15 ALC surveys indicate that the soil grade in W2 is predominantly ALC subgrade 3b (non-BMV). Areas of Grade 2 and Subgrade 3a soils (BMV) are present around the village of Ulley as well as to the north of the A57. A localised small area of Grade 1 soil is present to the south of Carr Lane. 23.9% of W2 has been classified as BMV following ALC surveys, as shown in **NTS Appendix 1, Figure 6: ALC Survey Results**.

Hydrology and Flood Risk

2.3.16 Several watercourses run through W2, including the River Rother, Ulley Brook, Kingsforth Brook, and Anston Brook. Flood mapping indicates that less than 2% of

W2 falls within Flood Zone 3 (high risk), and under 5% in Flood Zone 2 (medium risk).

W3

Overview

2.3.17 W3 covers approximately 172ha of agricultural land in RMBC, with a small portion crossing into NEDDC via the A618. It is bisected by the M1. W3 borders Harthill Reservoir, Hard Lane, and the A618, and lies just south of Kiveton Park and Wales. The landscape is broad and open, with elevated areas offering expansive views and lower areas enclosed by tree belts. Residential areas are mainly in nearby villages including Woodall, Harthill, High Moor, Kiveton Park, and Wales.

Landscape Designations

2.3.18 W3 is within the South and West Yorkshire Green Belt but is not covered by statutory landscape designations. It features a broad open landscape with expansive views from elevated areas, the topography consists of small hills such as Stone Hill in the west of W3. Several public footpaths and bridleways cross W3, linking surrounding communities and natural features.

Ecology and Wildlife Sites

2.3.19 W3 is not located within any European Protected Sites, nor does it contain any statutory ecological designations. However, Crabtree Wood SSSI is approximately 950 metres (m) southeast of W3. The non-designated Rother Valley Country Park lies 1km west of W3.

Heritage and Archaeology

2.3.20 There are no designated assets within W3, but nearby heritage assets include six Grade II Listed Buildings, one Grade II* Listed Building, one Grade I Listed Building, three conservation areas, one Scheduled Monument and one Registered Park and Garden at Barlborough Hall.

Ground Conditions and Land Quality

2.3.21 The ALC surveys undertaken indicate that the soil grade in W3 is predominantly ALC subgrade 3b. An area of Grades 1 and 2 and Subgrade 3a is present in the eastern section of W3, west of Harthill Reservoir and south of Woodall Lane, as well as small areas of Subgrade 3a in the west. The total coverage of BMV for W3 is 17.3%.

2.3.22 Historically, W3 was a coal mining area, with surface mining within the M1 corridor and 33 recorded mine entries (14 within W3), along with shallow mining zones and high-risk development areas.

Hydrology and Flood Risk

2.3.23 Harthill Reservoir borders the southeast of W3, with Broad Bridge Dike running north through W3. Approximately 5% of W3 falls within Flood Zone 3 (high risk), primarily associated with Broad Bridge Dike.

2.4 Components of the Proposed Development

2.4.1 The Proposed Development would contain the following components:

- Solar PV infrastructure
- Interconnection cables
- BESS
- Substations
- Highway works
- Landscaping and biodiversity mitigation / enhancement
- Drainage works
- Temporary construction compounds; and
- Other works.

2.4.2 The proceeding section provides further details on each of these components.

Solar PV Infrastructure (PV Modules, Mounting Structures, Fencing, and Power Conversion Stations)

Solar PV Modules

2.4.3 The solar PV infrastructure will comprise solar PV modules, mounting structures, fencing and power conversion stations.

2.4.4 Solar PV modules are made up of multiple PV cells which convert sunlight into direct current (DC) electricity. These will be at a maximum height of 3.8 m. The solar PV modules will be mounted on metal structures arranged in a table format in a fixed south facing system and set at an angle between 8 and 25 degrees for optimal sunlight absorption. An example of a typical solar PV array can be seen in **Image 1.** It should be noted that **Image 1** is an indicative representation, and the Proposed Development may not look exactly like this.

2.4.5 Perimeter fencing around the solar PV arrays would comprise wooden post and wire fencing or galvanised mesh, up to a height of 2.2m an example of which can be seen in **Image 1**. Mammal gates could also be incorporated into perimeter fencing to allow for movement of wildlife.



Image 1 Typical example of a solar PV array

Power Conversion Stations

2.4.6 Power Conversion Stations (PCS) are essential components of a solar energy system. They include inverters, transformers, and switchgear, which work together to manage and convert the electricity generated by the solar panels and prepare it to be transferred to the grid. The PCS units transform the electricity from DC to Alternating Current (AC), and increase the voltage.

2.4.7 The components of the PCS would be housed together in a single enclosure, designed in muted colours to blend in with the surrounding landscape. The enclosure will be limited to 3.5m in height. An example image of a typical PCS is provided in **Image 2**.



Image 2 Example of a PCS

Cable Corridors

2.4.8 W1, W2 and W3 would be connected to each other and to the Long Lane 400kV Substation using high voltage underground cables, potentially up to 400kV. At this stage in the development process, the Applicant has identified Cable Corridors which are larger than what will ultimately be needed for cable construction. They will be refined through further environmental surveys to inform the final design. Some routes have more than one option to connect the same areas, however only one of these would be needed for the Proposed Development.

2.4.9 The proposed routes for the Cable Corridors are shown in **NTS Appendix 1, Figure 4: Illustrative Masterplan**.

Battery Energy Storage System (BESS)

2.4.10 The Proposed Development would include a BESS that works alongside the solar PV array. The main purpose of the BESS is to store extra electricity when the sun is shining and release it when it's needed, such as during cloudy days or at night. It can also take in electricity from the grid when demand is low and save it for later, helping to keep the power supply steady and reduce waste. This makes the overall system more reliable and efficient, even when solar energy isn't available.

2.4.11 The batteries would be housed either in individual enclosures or within one or more larger structures. The maximum dimensions of these containers would be 13m long by 5m wide by 3.5m high. BESS units would be a muted colour, sensitive to the surrounding environment. The final number of enclosures will depend on the required power capacity and energy storage duration.

2.4.12 To help meet fire safety requirements, the BESS will include built-in fire suppression and cooling systems.

2.4.13 The BESS would be located adjacent to the Primary Substation, as shown in **NTS Appendix 1, Figure 4: Illustrative Masterplan**.

2.4.14 An example image of a typical BESS is provided in **Image 3**.



Image 3 Example of a BESS Unit

Substations (Satellite and Primary)

Satellite Substations

2.4.15 Smaller satellite substations would also be needed to collect power from the PCS units and increase the voltage.

2.4.16 The Proposed Development would require two satellite substations, one in W1 and one in W2. The locations of these are shown in **NTS Appendix 1, Figure 4: Illustrative Masterplan.**

2.4.17 Each satellite substation would occupy an area up to 90m by 130m, with a height of up to 13.5m. The areas would be surrounded by a metal fence approximately 3m high, with an extra 1m of electrified fencing on top. The fence would be in a muted colour to blend in with the surroundings.

Primary Substation

2.4.18 The Proposed Development would include a primary substation to collect electricity from the secondary substations and increase the voltage again so that it can be transferred to the National Grid. The location of the primary substation is shown in **NTS Appendix 1, Figure 4: Illustrative Masterplan.** It would be

located at least 300m from residential properties and would be designed to ensure the night-time noise level is limited.

2.4.19 The primary substation would be up to 170m long and 100m wide, with a maximum height of up to 13.5m. The primary substation would be surrounded by metal fencing approximately 3m high, with an extra 1m of electrified fencing on top. The perimeter fence would be a muted colour, sympathetic with the surrounding environment. An illustration of a typical primary substation can be found in **Image 4** Example of a 400kV Substation.



Image 4 Example of a 400kV Substation

Highway Works

2.4.20 Highway Works refer to the creation of access points and any localised upgrades to roads required to accommodate infrastructure delivery and traffic associated with the Proposed Development. Site access and transport routes have been developed in close consultation with the Highways Authorities and local councils.

Landscape / Green Infrastructure

2.4.21 Landscape / Green Infrastructure comprises all landscape, habitat enhancement, and biodiversity works to be undertaken as part of the Proposed Development, shown in **NTS Appendix 1, Figure 4: Illustrative Masterplan**. The Proposed Development has been designed to minimise adverse landscape and visual effects as much as practicable; and to maximise opportunities for delivering biodiversity net gain.

Drainage Associated with the Primary Substation

2.4.22 Drainage measures would be included in the design of the Primary Substation, to manage run-off and minimise potential impacts on local watercourses. These drainage measures could use one or more methods, such as swales (shallow,

vegetated depressions to direct and slow run-off), attenuation ponds (ponds to temporarily store excess rainwater), and leaky dams (barriers to slow flow of watercourses during storms), as well as others.

Primary Construction Compounds

2.4.23 During construction, temporary construction compounds are required to store materials and plant, and provide welfare facilities for workers. The indicative location of the temporary construction compounds can be seen in **NTS Appendix 1, Figure 4: Illustrative Masterplan**. Temporary construction compounds would have a maximum footprint of 200m by 200m.

2.4.24 Once construction is nearing completion, these construction compounds would be removed, and the area would be prepared for the construction of solar PV infrastructure.

Crossings Over Non-Navigable Watercourses

2.4.25 Where watercourses would need to be crossed for vehicular or pedestrian access during construction and operation, bridges or culverts would be installed, or existing crossings upgraded and/or repaired. The locations of these crossings are shown on **NTS Appendix 1, Figure 4: Illustrative Masterplan.**

Other Works

2.4.26 Other works for the Proposed Development would include on-site access tracks, fencing and closed-circuit television (CCTV), lighting, and glint and glare fencing. Other Works could be located anywhere in the Order Limits, other than in the areas of highway works and drainage for the primary substation.

2.4.27 Operational access tracks would be required for maintenance purposes and would not be within 50m of residential properties.

2.4.28 Daytime and infrared CCTV would be mounted inward-facing on poles at a maximum height of 4m, at the perimeter of the Site.

2.4.29 Lighting would only be installed at the Substation and BESS compounds and be operated manually or by sensors. Lighting would be directed inwards, away from ecological or residential receptors.

2.5 Phases of the Proposed Development

Construction Phase

2.5.1 Building the Proposed Development is expected to take between 24 and 36 months, starting in 2027. The Proposed Development is expected to be operational in 2029, in line with its planned connection to Long Lane 400kV Substation. Construction would take place in phases across the Site and Cable Corridors, so no single area will be under construction for the full duration.

2.5.2 The necessary construction activities would include, but are not limited to, the following:

- Preparing the Site, including construction compounds
- Delivering materials

- Preparing the ground for access tracks and building platforms and foundations for substations and batteries
- Installing solar panels, batteries and substations
- Installing underground cables either through trenches or trenchless crossings to avoid sensitive areas
- Planting landscaping and enhancing the environmental
- Installing the grid connection (underground cabling), including the creation of temporary access tracks and compounds and/or trenching and installation of buried cables
- Testing and commissioning of infrastructure; and
- Commissioning & final connection.

2.5.3 It is anticipated that construction hours would be between 0700hrs and 1900hrs Monday to Friday, 0700hrs to 1300hrs on Saturdays, and no working on Sundays or bank holidays. Exceptions to this may be required for trenchless crossings or for time sensitive construction activities that cannot be interrupted such as concrete pouring for platforms under substations and batteries.

2.5.4 Measures such as the above would be controlled via a Construction Environmental Management Plan (CEMP). This plan will set out the mitigation measures to be implemented during the construction phase. Approval for the CEMP would be sought from the relevant planning authorities before construction begins.

Operation and Maintenance Phase

2.5.5 The Proposed Development is expected to operate for 60 years. During this time, it is anticipated that activity in any one part of the Site would be minimal and mainly involve landscape and ecological management, maintaining equipment, replacing any parts that stop working, and carrying out regular inspections.

Decommissioning Phase

2.5.6 The decommissioning phase is expected to take between 12 and 24 months, after which the Site will be returned to the landowners, and arable farming could resume, subject to the landowners' wishes. Removal of BESS and substation foundations to 1.2m BGL would be completed subject to landowner agreement. Decommissioning would involve the dismantling and recycling of the solar PV arrays and associated vehicle movements. Components of the Proposed Development such as mitigation planting, Site accesses and cable ducts below plough depth may be left in place subject to landowner agreement.

2.5.7 Decommissioning activities would be managed via a Decommissioning Environmental Management Plan (DEMP). The Approval for the DEMP would be sought from the relevant planning authorities before decommissioning begins.

3 ALTERNATIVES AND DESIGN EVOLUTION

3.1 Context

3.1.1 Considering alternatives is a legal and practical requirement in the EIA process because it helps ensure that the Proposed Development is the most suitable option for both local communities and the environment while still fulfilling project objectives. The Applicant has considered alternatives by exploring different locations, designs, technologies, and construction methods. The following sections explain how these alternatives were considered and how environmental studies have influenced the design.

3.2 Alternative Renewable Technologies

3.2.1 The Applicant has taken into consideration alternative technologies within the development notwithstanding it is a solar developer. Solar energy has been identified as the most suitable technology for the scale of generation required to make best use of the connection capacity made available at Long Lane 400kV Substation. However, the Applicant is aware that a large portion of the Site has been identified by RMBC as being suitable for wind development, and notes that there are wind turbines in the local area.

3.2.2 To generate a comparable amount of renewable energy through wind power to what the Proposed Development seeks to generate would require in excess of 150 4.5MW turbines (approximately 200m tip height). The associated environmental impacts for a wind development of this scale would likely be greater than anticipated for a solar development.

3.2.3 Given the location of the point of connection at the Long Lane 400kV Substation (approximately 96km from the nearest coast), offshore generation technologies such as tidal and offshore wind were not considered.

3.3 The ‘Do Nothing’ Alternative

3.3.1 The "do nothing" alternative refers to the scenario where the Proposed Development is not implemented, and the Site remains in its current state.

3.3.2 The consideration of ‘do nothing’ has not been deemed as a reasonable alternative to the Proposed Development. The rationale is that without solar farm developments, this form of renewable energy would not contribute to achieving the net zero targets outlined in the UK Government’s Clean Power 2030 Action Plan[2].

3.3.3 The same rationale has been applied to the alternative of a ‘smaller development’ than the Proposed Development. A smaller development would not make full use of the grid agreement or contribute as significantly to national goals for clean, cheap and secure energy.

3.4 Selection of the Solar PV Area

3.4.1 New energy projects can only connect to the grid in locations with available capacity, so the starting point of the site selection process was the available capacity at the existing 275kV Brinsworth Substation (National Grid Brinsworth Substation). The Applicant then applied a 12km Search Area from the grid connection location at the National Grid Brinsworth Substation to search for suitable land.

3.4.2 The site selection process sought to identify available land, meaning urban areas of Rotherham and Sheffield were not considered appropriate. The area covered in this Search Area can be viewed on **NTS Appendix 1, Figure 8: 12km Search Area**.

3.4.3 After identifying available land, the Applicant completed a selection study which sought to identify the most suitable land. The following key site selection factors were considered:

- **Distance to Network Connection** - the Site selection focused on the area around the National Grid Brinsworth Substation with preference given to the closest appropriate sites
- **Irradiance and Site Topography** – preference was given to land with a south facing aspect and flatter topography, therefore with higher irradiance (amount of sunlight or radiant energy received on a surface)
- **Distance to dwellings** – the Site selection sought to avoid sites that were close to residential dwellings
- **Agricultural Land Classification** – the process sought to minimise the impact on high quality agricultural land
- **Accessibility** – the site selection considered access routes to the Proposed Development, during construction, operation and maintenance, and decommissioning; and
- **PRoWs** - the process sought to avoid and minimise the visual impact from PRoWs.

3.4.4 In addition, the Applicant considered the following environmental designations:

- **Ecological and Heritage Assets** – the Applicant considered distance to ecological and heritage (buildings and buried remains) assets and aimed to avoid or reduce any effects on them
- **Green Belt** – the Applicant considered the location of the Green Belt, potential impact and whether special circumstances exist that would justify development in the Green Belt; and
- **Flood Risk** – the Applicant considered areas of high flood risk.

3.4.5 The area for the Proposed Development was chosen after considering environmental, planning, and land availability factors.

3.4.6 At the end of 2024, the Applicant received an update to its connection offer from National Grid to change the point of connection from the National Grid Brinsworth Substation to the new 400kV National Grid substation proposed on land immediately east of Long Lane, Brinsworth, S60 4JJ. (Long Lane 400kV Substation).

3.5 Selection of the Cable Corridors

3.5.1 Once the main solar PV areas (W1–W3) were chosen, the next step was to make sure they could be linked together and connected to the Long Lane 400kV Substation.

3.5.2 Cable Corridors were initially developed by identifying the most direct route between areas to connect and rerouting to avoid residential areas. The identification of Cable Corridors also aimed to minimise impacts on environmental assets including ecological and heritage designations, areas of woodland, and watercourses where possible.

3.5.3 Several Cable Corridors were considered and assessed for their suitability as part of the Proposed Development. Since the cables will be buried and only accessed for maintenance after construction, the land can be returned to its original use post construction. Assessment factors include:

- Area available
- Total length of route
- Proximity to Scheduled Monuments, Listed Buildings, Archaeological designations and Registered parks
- Crossings of Network Rail and National Highways assets
- Crossings of buried utilities (electricity, high pressure gas, etc)
- Local Nature Reserves, National Nature Reserves
- Proximity to houses (as possible); and
- Access to site for construction and decommissioning.

3.6 Design Evolution

3.6.1 The Applicant aims to maximise the amount of clean energy generated for the National Grid, whilst designing a socially and environmentally sensitive development. The Proposed Development has therefore been designed in accordance with the following principles:

1. Maximise the amount of clean energy exported to the National Grid
2. Craft a project that is resilient to the impacts of climate change
3. Take opportunities to limit the amount of embodied carbon across the Proposed Development
4. Engage with stakeholders to develop the design
5. Support local ecology and enhance biodiversity
6. Find out what is important to people about the local area and seek to incorporate feedback
7. Consider how people engage with their local environment and retain these patterns and practices where possible
8. Enhance recreational access across the landscape
9. Respect landscape character and cultural heritage
10. Minimise visual impact

11. Contribute to the local economy; and
12. Support research and development.

3.6.2 Based on the principles outlined above, the design of the Proposed Development has been shaped through a four-stage process, which has guided its development. This process is shown in **Plate 3.1.**

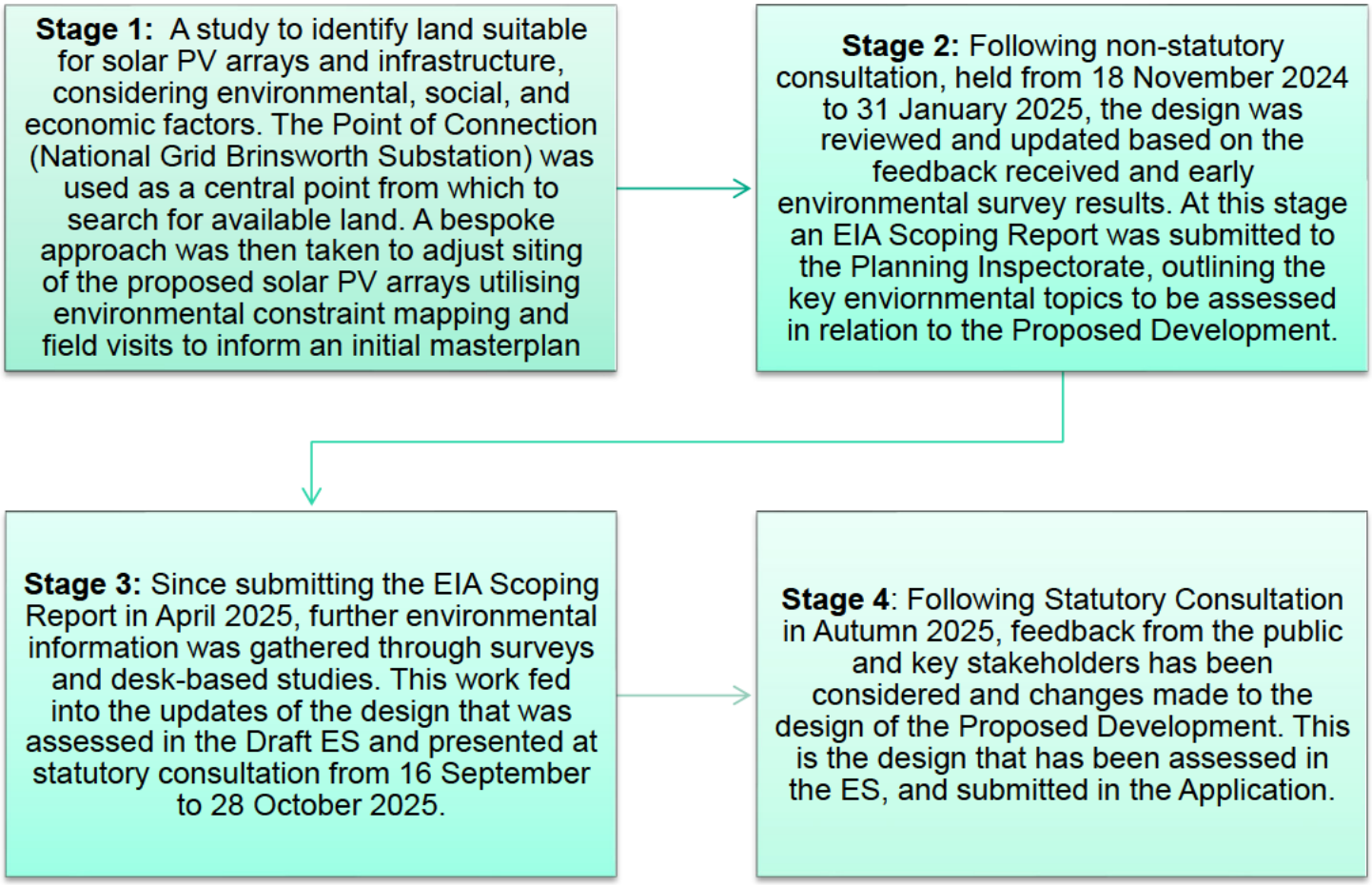


Plate 3.1 Design Evolution Stages

4 ENVIRONMENTAL IMPACT ASSESSMENT PROCESS

4.1 What is an Environmental Impact Assessment (EIA)?

4.1.1 The EIA is a structured process used to identify, predict, and assess the potential significant effects of the Proposed Development on the environment. These effects can be either 'no change', 'adverse', meaning harmful or negative, or 'beneficial', meaning positive outcomes. The EIA also plays a critical role in determining suitable measures to avoid, reduce, or offset adverse impacts. Selecting appropriate mitigation measures involves a careful analysis of the nature, scale, and likelihood of potential effects, as well as how mitigation can be applied.

4.1.2 The aim of the ES is to allow decision makers to make evidence-based judgements about the potential beneficial and/or adverse environmental impacts presented by the Proposed Development.

4.1.3 The key elements of the EIA process are shown in **Plate 4.1**

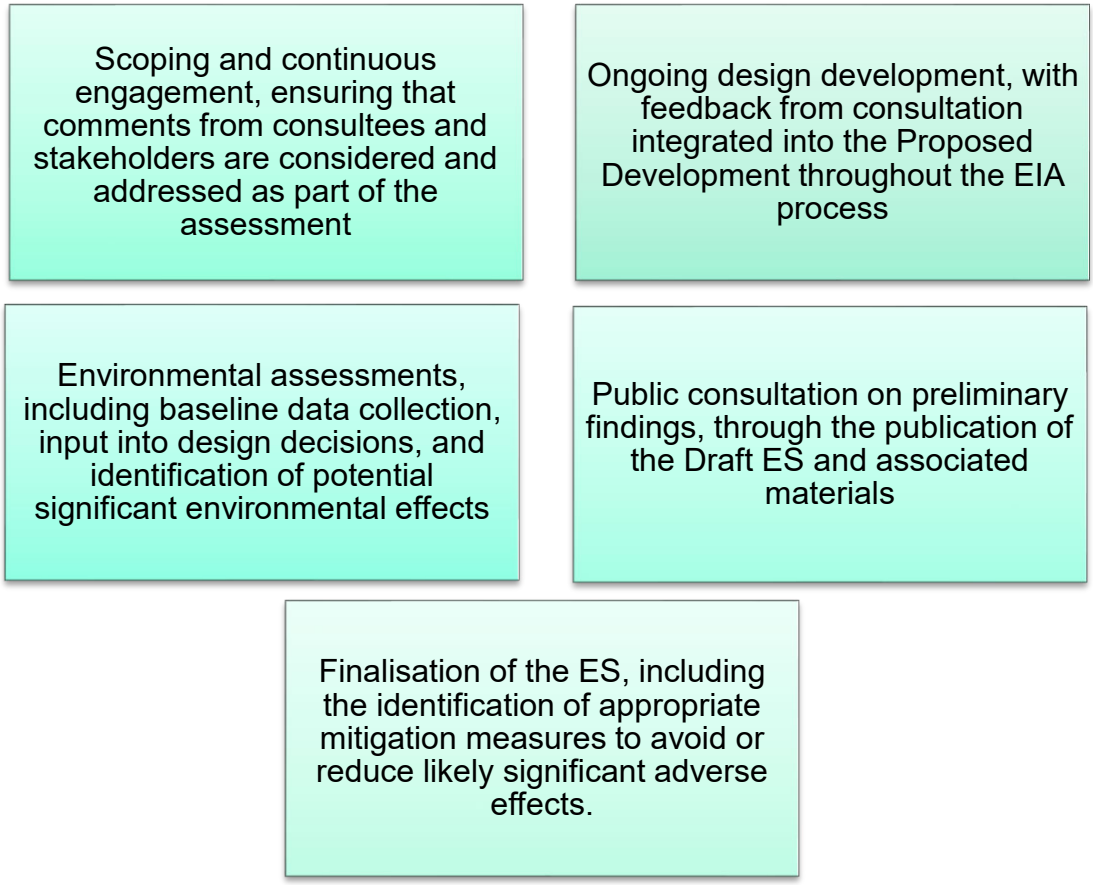


Plate 4.1 Key Elements of the EIA Process

4.2 The EIA Process for the Proposed Development

4.2.1 The key phases of the EIA consist of consultation and engagement, EIA Scoping, Draft ES, and ES. Additional information regarding these key stages is provided below.

Consultation and Engagement

4.2.2 Consultation is a key part of developing a well-balanced ES and is also a requirement of the planning process for a DCO. The Applicant is required to consult with local communities, local authorities, parish councils, technical bodies such as Natural England and the Environment Agency, and anyone who may have an interest in the land being used for the Proposed Development.

4.2.3 The Applicant held two consultations on the Proposed Development. The first consultation was held in the Autumn of 2024 on the initial masterplan and approach to EIA. The second consultation took place in Autumn 2025 on the updated masterplan and Draft ES. Outside of these stages of consultation, the Applicant has had ongoing engagement with relevant stakeholders, members of the community, technical bodies, and elected officials. A timeline of these activities is presented in **Plate 4.2** below.

4.2.4 Listening to feedback has been important for understanding different interests in the Proposed Development and has helped to shape the design and assess potential environmental effects in a way that reflects local priorities and concerns.



Plate 4.2 Pre-Application Activities Timeline

EIA Scoping

4.2.5 In early 2025, an initial exercise was carried out to identify the main environmental topics likely to be affected by the Proposed Development. This stage, known as EIA Scoping, helped define which environmental aspects should be assessed and how they would be considered during the EIA. The outcomes of this exercise were

documented in a Scoping Report, which was submitted to the Planning Inspectorate in April 2025.

4.2.6 The Planning Inspectorate shared the Scoping Report with a range of consultation bodies for their feedback. These included organisations such as Natural England, the Environment Agency, Historic England, City of Doncaster Council, Rotherham Metropolitan Borough Council, and local parish councils.

4.2.7 The feedback received was compiled by the Planning Inspectorate into a formal Scoping Opinion, issued on 03 June 2025. This document outlined areas of agreement and highlighted any concerns or recommendations. Following this, further discussions were held with consultees to confirm the approach for assessing each environmental topic.

4.2.8 The key issues raised during this process, along with how they were addressed, are detailed in the technical chapters of the ES.

Draft Environmental Statement

4.2.9 The Draft ES presented the preliminary findings of environmental assessments to help consultees (including technical bodies, stakeholders, and the public) understand the potential environmental effects of the Proposed Development.

4.2.10 The purpose of the Draft ES was to support meaningful consultation. It gives consultees the opportunity to review and comment on the emerging environmental information and design of the Proposed Development. Feedback received during this stage has helped to shape the final design of the Proposed Development and the environmental assessments.

Environmental Statement

4.2.11 The ES presents the full findings of the EIA. It provides a comprehensive and evidence-based account of the likely environmental effects of the Proposed Development, including any updates or new information gathered since earlier consultation stages. The ES has been submitted alongside the Application and will be used by decision-makers to assess whether the Proposed Development should proceed, and under what conditions, based on its potential environmental impacts.

4.3 EIA Methodology

4.3.1 For each environmental topic, the Applicant has assessed the ‘existing baseline’ and the ‘future baseline’. The existing baseline is determined by assessing existing conditions within an appropriate study area around the Proposed Development to establish a starting point for assessment. It provides a reference against which potential changes caused by the Proposed Development can be measured. In addition, a future baseline was considered, which involves forecasting how conditions are likely to evolve over time if the Proposed Development does not go ahead. This helps to distinguish the effects of the Proposed Development from changes that would occur naturally or due to other influences, ensuring a more accurate and meaningful assessment of its environmental impact.

4.3.2 As part of the assessment, key features or groups that could be affected (referred to as ‘receptors’) were identified within the existing baseline. These might include

wildlife, habitats, heritage assets, or local communities. The Applicant then considered how sensitive to change each receptor is. A summary of each of the topics considered within the ES is provided in Section 5.

Determining Significance in EIA (Generic)

4.3.3 The significance of an environmental effect is generally based on two key factors:

- **Sensitivity of the Receptor** – how vulnerable or valuable the affected feature is (e.g. a rare species or a densely populated area); and
- **Magnitude of the Impact** – how big the change is, including its scale, how long it lasts, and whether it can be reversed.

4.3.4 The way sensitivity and magnitude are assessed can vary depending on the environmental topic.

4.3.5 The significance of effect is determined by evaluating the sensitivity of the receptor in relation to the magnitude of the impact and can be concluded as either Significant or Not Significant.

4.4 Design and Mitigation Process

4.4.1 The EIA identifies mitigation measures to be incorporated into the design of the Proposed Development that will avoid or reduce environmental effects. This is known as the mitigation hierarchy and involves:

1. **Avoid where Possible:** through site selection and design (e.g. setback areas, exclusion of sensitive areas, sensitive siting of components);
2. **Prevent/Reduce:** via embedded controls and design refinements (e.g. noise barriers, drainage design, landscaping);
3. **Offset/Compensate:** for effects remaining after mitigation measures are in place (known as 'residual impacts') (e.g. habitat creation, heritage enhancement).

4.4.2 Embedded mitigations are measures which are integrated into the design of the Proposed Development and are considered within the EIA. Should a significant effect be determined, additional mitigation measures may be required to reduce the significance of the effect further.

4.5 Environmental Management Plans

4.5.1 A series of outline environmental management plans have been submitted as part of the Application. These plans set out the key principles and strategies for managing environmental effects during each phase of the Proposed Development (construction, operation and maintenance, and decommissioning). Assuming the development is consented, the outline management plans will be developed into the relevant management plans post-consent and/or prior to the commencement of the relevant development phase, ensuring that mitigation measures are appropriately refined and implemented. **Table 4.1** summarises the key management plans.

Table 4.1 Environmental Management Plans

Plan	Summary Description
Construction Environmental Management Plan (CEMP)	Sets out the key principles and practices to minimise environmental impacts during the construction phase of the Proposed Development.
Construction Traffic Management Plan (CTMP)	Sets out measures to manage construction-related traffic and reduce disruption to local roads and communities.
Site Waste Management Plan (SWMP)	Details how materials and waste will be handled responsibly during construction, with a focus on reducing waste and promoting reuse or recycling.
Battery Safety Management Plan (BSMP)	Describes safety procedures for the battery storage system, including fire prevention, detection, and emergency response measures.
Soil Management Plan (SMP)	Provides guidance on how soils will be protected and managed to preserve their quality and support future land use.
Landscape and Ecology Management Plan (LEMP)	Sets out actions to protect and enhance the Site's landscape, biodiversity, and heritage features during and after construction.
Surface Water Drainage Strategy (SWDS)	Describes how surface water will be managed during and after construction to prevent flooding, protect water quality, and ensure compliance with relevant drainage standards.
Archaeological Written Scheme of Investigations (WSI)	Sets out the approach to identifying, recording, and preserving archaeological features, including methods for investigation and mitigation during construction.
Public Rights of Way Management Plan (PRoWMP)	Details how public footpaths, bridleways, and other rights of way will be protected, maintained, and managed during construction to ensure safe access and minimise disruption for users.
Operational Environmental Management Plan (OEMP)	Provides environmental controls during the operational phase, including maintenance activities. It also secures the preparation of the following post-consent plans by contractors: - Emergency Response Plan; and - Health and Safety Plan.
Decommissioning Environmental Management Plan (DEMP)	Establishes the approach to managing environmental effects when the Proposed Development is taken out of use and the Site is restored.

5 LIKELY SIGNIFICANT ENVIRONMENTAL EFFECTS

5.1 Introduction

5.1.1 This section outlines the environmental effects of the Proposed Development as identified in the ES. For each topic, potential effects are considered across the construction, operation and maintenance, and decommissioning phases where relevant. The assessment takes account of mitigation measures to avoid or reduce environmental effects.

5.2 Biodiversity and Nature Conservation

Key Terms

Term	Explanation
Special Protection Area (SPA)	A protected area for birds that are rare or vulnerable, helping to conserve their habitats.
Special Area of Conservation (SAC)	A protected site for important wildlife and habitats, designated to help preserve biodiversity.
Site of Special Scientific Interest (SSSI)	A nationally important area for wildlife, plants, or geology, protected by law.
Local Nature Reserve (LNR)	A locally important area for wildlife, animals and plants, protected by law.
Local Wildlife Site (LWS)	A locally recognised area that supports valuable wildlife or habitats, which is not protected by law, but through local authorities as part of their duties.
UK Habitat Classification (UKHab) Assessment and Condition Assessment	A UKHab assessment identifies and maps the types of habitats present on a site. A condition assessment evaluates how healthy or well-functioning those habitats are, helping ecologists understand both what is there and how well it supports wildlife.
Environmental DNA (eDNA) Sampling	A method used to detect the presence of species in an area by collecting tiny traces of DNA they leave behind in the environment.
Outline Landscape and Environmental Management Plan (oLEMP)	A preliminary document that sets out the proposed strategies and measures to protect, manage, and enhance biodiversity and landscape features during the construction and operation of a development.

Introduction

5.2.1 The Biodiversity and Nature Conservation chapter establishes a baseline for ecological features within the Proposed Development's Study Area. It evaluates the potential significant impacts on biodiversity and nearby sites of importance for nature conservation resulting from the construction, operation and maintenance, and decommissioning phases of the Proposed Development.

Existing Baseline

5.2.2 Baseline information has been gathered through a combination of ecological surveys and desk-based studies. Surveys have been completed in areas where access was available, with desk-based assessments used where access constraints applied.

5.2.3 The baseline conditions for different ecological receptors are presented below.

Designated Sites

5.2.4 There are no internationally protected nature sites (such as SPAs or SACs) within approximately 16km of the Order Limits. Based on Scoping feedback from the Planning Inspectorate, these sites do not need to be assessed further as there are no pathways for effects to occur to the designated features they protect.

5.2.5 Eleven SSSIs (nationally designated) have been identified within 5km of the Order Limits; the closest of which is Crabtree Wood, approximately 0.9km southeast of W3.

5.2.6 Several Local Nature Reserves (locally designated) are located within 2km of the Order Limits, supporting habitats including standing open water, woodland, wetland, flowing river systems and green corridors for wildlife movement.

5.2.7 Multiple LWSs are present within 2km of the Order Limits; the closest of which is Brampton Common which falls partly within the Order Limits.

5.2.8 The location of the above local, national, and international ecological designated sites can be viewed on **NTS Appendix 1, Figure 9: Local Designated Sites** and **Figure 10: International and National Designated Sites**.

Habitats

5.2.9 UKHab and Condition Assessments of the Site and all accessible land of habitat value within the Cable Corridors, including up to 30m beyond the width where relevant, was undertaken. UKHab surveys revealed the majority of land surveyed to be cereal cropland, such as wheat, barley, oilseed rape and beans. This land is generally intensively managed; however, small areas of modified grassland, neutral grassland, arable field margins, native scrub and hedgerows (all priority habitats) were identified. In areas surveyed, fields were mostly bordered by native hedgerows. There is no ancient woodland within the Order Limits.

Protected Species

5.2.10 Information pertaining to badgers is not publicly accessible to protect the locations of these sensitive species; however, it will be made available upon request to the relevant authorities for their review.

5.2.11 Ground-nesting birds such as lapwing, grey partridge, skylark and yellow wagtail are identified within the Site. Other breeding bird species within the Site and surrounding area included barn owl, with hobby also recorded within the wider Study Area.

5.2.12 Environmental DNA (eDNA) surveys have been undertaken across multiple ponds within the Study Area to assess the presence of great crested newt (GCN). No positive records of GCN were identified in these surveys.

5.2.13 Reptile surveys recorded grass snake to be present in small numbers, and there was no evidence of a widespread reptile population.

5.2.14 Otter and water vole surveys have also been undertaken where access permitted. No evidence of water vole was recorded. Signs of otter, including spraints and couches, were identified within the Study Area; however, no holts or confirmed resting places were recorded.

5.2.15 Bat surveys identified a number of trees potentially suitable for roosting bats. Bat activity surveys recorded a range of species typical of the local area, including *common pipistrelle*, *soprano pipistrelle*, *Nathusius' pipistrelle*, *noctule/Leisler bats*, *Myotis species* and *brown long-eared bat*.

Other Ecological Features

5.2.16 Wintering bird surveys identified a range of bird species of conservation interest, however no large or regularly occurring assemblages of internationally or nationally important bird species were recorded within the Study Area.

5.2.17 Priority species, including *brown hare*, *European hedgehog* and *common toad*, were recorded during field surveys and desk-based assessments within the Study Area.

5.2.18 An aquatic ecology desk study has been completed within the Order Limits and surrounding areas. Where necessary, eDNA sampling has been undertaken to assess the presence of migratory fish and other fish species of interest.

5.2.19 Signal crayfish, an invasive non-native species listed on Schedule 9 of the Wildlife and Countryside Act 1981, has been recorded in watercourses throughout the Study Area. Other invasive non-native species identified include *Japanese knotweed*, *Indian (Himalayan) balsam*, *New Zealand pygmyweed* and aquatic invasive plant species.

What are the Effects on Biodiversity and Nature Conservation and How are They Avoided or Managed?

Construction

Designated Sites

5.2.20 There is potential for indirect effects to nationally designated SSSIs during construction due to air emissions associated with construction traffic and the risk of pollution affecting designated aquatic sites. With suitable pollution prevention measures and due to the local scale and short-term duration of air emissions, effects to SSSIs are concluded to be **Not Significant**.

5.2.21 Brampton Common LWS lies partly within the Order Limits. The Proposed Development has been designed with specific measures to protect and manage

key features of the LWS, including breeding skylark habitat and native species-rich hedgerows. However, site clearance and access requirements are assessed to result in a low magnitude, local, **Significant** effect to Brampton Common LWS in the short-term. Enhancement measures for the Brampton Common LWS will be secured by the LEMP and will compensate for effects during construction.

5.2.22 Effects from lighting, noise, dust, and pollution effects from the Proposed Development on all other identified LWSs and LNRs are assessed to be short-term and local and are concluded to be **Not Significant**.

Habitats

5.2.23 There is potential for loss of priority habitats like native hedgerows and wet woodland during the construction phase. Effects to these priority habitats are considered to be of local and **Significant** effect in the medium-term. It is anticipated that hedgerows and wet woodland will be enhanced via measures within the LEMP which will compensate for effects during construction.

5.2.24 Effects to all other habitats and priority habitats are assessed as **Not Significant**.

Protected Species

5.2.25 The Proposed Development incorporates set-back distances and avoidance measures in relation to known and potential protected species, which have been informed by survey results. Construction activities will follow best-practice mitigation to avoid direct harm to nesting birds, including timing restrictions, and exclusion zones where necessary.

5.2.26 The embedded mitigation and habitat enhancement strategy is illustrated in **NTS Appendix 1, Figure 4: Illustrative Masterplan**.

5.2.27 Overall, with the application of embedded mitigation and management measures through the CEMP and LEMP, construction effects on protected species including breeding birds are assessed as **Not Significant**.

Operation and Maintenance

5.2.28 Habitat creation and enhancement measures are expected to deliver net benefits for biodiversity and nature conservation over the lifetime of the Proposed Development. Enhancement of the Brampton Common LWS and priority habitats are expected to secure **Significant Beneficial** effects in the medium to long-term.

5.2.29 Enhancement measures secured through the LEMP are also expected to result in **Significant Beneficial** effects on bats, otter, badger, reptiles, brown hare, breeding bird assemblage, barn owl and hobby.

5.2.30 There are no foreseeable significant effects on nationally important designated sites, and no significant effects are assessed on skylark and lapwing during the operation and maintenance phase.

5.2.31 A Biodiversity Net Gain (BNG) above 10% will be achieved for habitat area, hedgerows and watercourses. Habitat enhancements will be maintained for at least 30 years from the completion of the habitat creation or enhancement works.

Decommissioning

5.2.32 During the decommissioning phase, potential effects on biodiversity and nature conservation are anticipated to be similar to, or less than, those identified for the construction phase. Effects will be managed through the preparation and implementation of a DEMP, with mitigation measures similar to those applied during construction to avoid or minimise impacts to habitats and species.

5.3 Landscape and Visual

Key Terms

Term	Explanation
Area of High Landscape Value	Local designation under City of Doncaster Council planning policy as an area pertaining to have local landscape value under Doncaster's Local Development Framework.
Ancient Woodland	Ancient woodland is land that has been continuously wooded since at least the year 1600 in England.
Landscape Character Areas	Distinct countryside or urban fringe areas have unique characteristics shaped by natural features (hills, rivers, vegetation) and human influences (buildings, roads, land use). They are categorised based on their visual and cultural differences from surrounding areas.
Year 1	Visual effects are assessed at the end of construction. Mitigation planting is newly installed and offers minimal screening.
Year 15	Visual effects are reassessed once planting has matured. Screening is more effective, and visual impact is typically reduced.
Representative Viewpoints	Selected locations from which baseline photography is taken. The views from these locations are assessed as they are representative of key receptor views (such as houses or public rights of way) over the Site.

Introduction

5.3.1 The Landscape and Visual chapter is informed by Zones of Theoretical Visibility (ZTV) and assesses the potential significant effects on landscape character and on views experienced by people arising from the construction, operation and maintenance, and decommissioning of the Proposed Development.

5.3.2 For the operation and maintenance phase, landscape and visual effects are assessed at two points in time: Year 1, representing the period shortly after construction is completed, and Year 15, when the proposed new planting has matured. This approach enables the assessment to capture both the early operational effects and the longer-term effects of the Proposed Development.

Existing Baseline

5.3.3 A combination of survey and desk-based data sources have been used to identify key landscape features and potential visual receptors that may be subject to change as a result of the Proposed Development.

5.3.4 Site visits have been undertaken to verify desk-based findings and to identify and record representative viewpoints. Fieldwork was carried out during winter and

summer conditions to reflect seasonal differences in vegetation cover and visibility.

Landscape Character

5.3.5 The landscape within the Study Area comprises a combination of gently undulating farmland and low-lying areas, with occasional small hills, ridgelines and escarpments above wider valleys. Settlements are generally dispersed, with small villages and hamlets set within the rural landscape. Settlements located in proximity to the Site include, from north to south, Conisbrough, Firsby, Clifton, Micklebring, Wickersley, Thurcroft, Dinnington, Ulley, Aston, Wales, Kiveton Park, Anston, Harthill, Woodall, and High Moor. The landscape contains frequent belts of trees and woodland, which contribute to a generally well-wooded character.

5.3.6 Land use is predominantly arable, with fields defined by mature hedgerows, while steeper or less intensively farmed land supports pasture, including mixed livestock grazing. Horse paddocks are present around the edges of some settlements.

5.3.7 No part of the Proposed Development or the Study Area is located within a nationally designated landscape, such as a National Park or National Landscape.

Visual Effects

5.3.8 Visual receptors within the Study Area were identified using ZTV and informed by fieldwork. Visual receptors that may experience changes as a result of the Proposed Development include local residents, users of public rights of way and long-distance walking routes, visitors to recreational areas and heritage assets, and users of the local road network. The varied topography of the landscape allows for some longer-distance and wider views from elevated locations and settlement edges, as well as more contained views shaped by landform, woodland, tree belts and hedgerows within the valleys.

What are the Landscape and Visual Effects and How are They Avoided or Managed?

Construction

5.3.9 During construction, temporary changes would occur to the appearance of the landscape due to the presence of construction compounds, machinery, materials and lighting. **Significant** effects on landscape character are identified in some locations, particularly within W1 and W2. For some nearby residents and users of public rights of way, **Significant** visual effects may also occur during construction, particularly at viewpoints close to or elevated above the Site.

5.3.10 During construction, a CEMP will be implemented. This includes measures to control lighting, protect retained vegetation, limit removal of vegetation to where necessary, and manage site activities to minimise visual disturbance.

5.3.11 No significant effects have been identified during the construction of the Cable Corridors. The cables would be installed below ground, construction activities would be temporary and localised, and land would be reinstated following completion of works.

Operation and Maintenance

Year 1

5.3.12 During the early operational period (Year 1), changes to the landscape would result from the presence of solar PV modules and associated infrastructure, including substations. The assessment identifies **Significant** effects on landscape character within the closest landscape character areas, while more distant areas experience **Not Significant** effects. As mitigation planting establishes, effects reduce over time, with significant effects remaining confined to limited localised areas 15 years after construction.

5.3.13 Viewpoints may experience significant visual effects in Year 1 before mitigation planting has matured. Representative viewpoints are grouped by development areas W1, W2 and W3 and are illustrated in **NTS Appendix 1, Figures 11, 12, and 13**.

5.3.14 At Year 1, **Significant** visual effects were identified at a number of residential and recreational viewpoints. The remaining viewpoints were assessed as experiencing **Not Significant** effects.

Year 15

5.3.15 During operation (Year 15) the Proposed Development would result in a **Significant** effect upon parts of W1 and W2. All other landscape character areas were found to have **Not Significant** effects.

5.3.16 By Year 15, mitigation planting is expected to have matured sufficiently to reduce visibility and help integrate the Proposed Development into the surrounding landscape. The assessment identifies **Significant** effects at a small number of viewpoints and all other viewpoints were assessed as experiencing **Not Significant** effects.

5.3.17 An oLEMP sets out how existing vegetation would be managed and how new planting would be established and maintained, delivering long-term landscape integration, improved connectivity and biodiversity benefits. Indicative mitigation planting locations are shown in **NTS Appendix 1, Figure 4: Illustrative Masterplan**.

5.3.18 No significant night-time landscape or visual effects are anticipated, as the solar arrays would not be lit and any operational lighting would be limited, directional and used only where necessary.

Decommissioning

5.3.19 Decommissioning effects are expected to be similar to or less than construction effects and would involve the removal of above-ground infrastructure and restoration of the land. These effects would be short-term, temporary and reversible.

5.4 Cultural Heritage and Archaeology

Key Terms

Term	Explanation
Direct impacts / effects	Immediate impacts caused by a project or activity that physically alters or damages archaeological sites or cultural heritage assets.
Indirect impacts / effects	Secondary or consequential impacts that may not involve physical contact but still affect the context, setting, or significance of heritage assets.
Geophysical surveys	A non-invasive method used to detect, and map buried archaeological features without excavation. It helps archaeologists understand what lies beneath the surface before digging.
Setting	The area around a heritage site that helps define its character, meaning, and value. It's not just about what's nearby physically, but also how the Site is experienced visually, historically, and culturally.

Introduction

5.4.1 The Cultural Heritage and Archaeology chapter provides a heritage baseline for defined Study Areas and assesses the likely direct and indirect effects arising from the construction, operation and maintenance, and decommissioning phases of the Proposed Development.

Existing Baseline

5.4.2 Baseline conditions for cultural heritage and archaeology have been established through a combination of desk-based research and field surveys across the Proposed Development. This has included walkover surveys and site visits to understand the setting of heritage assets within the Order Limits and Study Area, alongside the use of data held by local and national heritage bodies, Historic Environment Records and local archives.

5.4.3 To inform the archaeological baseline, the Applicant completed a programme of non-intrusive geophysical surveys across the areas proposed for solar PV arrays and other permanent infrastructure within the Site. These surveys use non-intrusive technology such as ground penetrating radar to identify buried features. A desk-based assessment has also been undertaken to consider the potential for earlier, deeply buried remains. The results of these studies indicate that archaeological remains within the Site range from the Early Prehistoric to the modern period and include evidence of later prehistoric and Romano-British settlement, associated enclosures and field systems, medieval and post-medieval agricultural activity, and more recent industrial and military features.

5.4.4 The assessment has identified a number of areas where archaeological remains may be more concentrated or of greater research interest. These areas have informed the design of the Proposed Development and the mitigation strategy. Where required, further targeted archaeological investigation will be undertaken in advance of construction in accordance with an agreed Written Scheme of Investigation.

What are the Cultural Heritage and Archaeology Effects and How are They Avoided or Managed?

Construction

5.4.5 Direct effects on cultural heritage and archaeology are most likely to occur during the construction phase, when below-ground archaeological remains may be disturbed by groundworks associated with infrastructure installation. Any such effects would be limited to the footprint of the Proposed Development and associated construction activity.

5.4.6 Physical indirect effects can arise from construction activities, including ground vibration or the potential introduction of contaminants such as fuels or hydraulic fluids. Indirect effects on the setting of heritage assets may also occur during construction, where new above-ground infrastructure alters the surroundings in which heritage assets are experienced.

5.4.7 Where possible, areas of heightened archaeological sensitivity will be avoided. Where avoidance is not practicable, infrastructure will be installed using construction methods that minimise disturbance to subsurface archaeological remains. Where disturbance cannot be avoided, further archaeological investigation and mitigation will be undertaken in agreement with South Yorkshire Archaeology Service and, where relevant, Historic England.

5.4.8 Should any features be discovered during construction, the activities for preserving and recording these would be prescribed by the Archaeological Investigation and Preservation Strategy, which will be developed prior to construction. This staged approach ensures that archaeological remains are appropriately understood, recorded or preserved in advance of construction.

5.4.9 With the application of embedded mitigation measures, direct and indirect effects on archaeological remains during construction are assessed as **Not Significant**.

Operation and Maintenance

5.4.10 Indirect effects on setting are principally associated with the operational phase of the Proposed Development. These effects are managed through design refinement, appropriate siting of infrastructure, and landscape-led mitigation, including the use of planting to reduce or filter views of the Proposed Development. These effects would be reversible and would cease upon decommissioning, when above-ground infrastructure is removed and the land is reinstated. Taking all embedded mitigation into account, indirect effects on the setting of heritage assets during operation and maintenance, are assessed as **Not Significant**.

Decommissioning

5.4.11 With the application of embedded mitigation measures highlighted above, direct and indirect effects on archaeological remains during decommissioning are assessed as **Not Significant** as they will be similar to activities during construction.

5.5 Ground Conditions and Land Quality

Key Terms

Term	Explanation
Phase 1 Contaminated Land Report	A Phase 1 Contaminated Land Report is a preliminary environmental assessment that reviews historical land use, environmental records, and can include a site walkover to identify potential contamination risks and determine if further investigation is needed.
Preliminary Risk Assessment	An initial environmental study that identifies potential risks from land contamination by reviewing historical land use, environmental data, and conducting a site inspection to decide if further investigation is needed.
Agricultural Land Classification (ALC)	A system used in the UK to grade land based on how good it is for farming. It ranges from Grade 1 (excellent quality) to Grade 5 (very poor quality).
Best and Most Versatile (BMV)	BMV refers to the highest quality agricultural land in England. It is land that is most productive, flexible, and efficient for growing crops. BMV land is classified as Grades 1, 2, and 3a under the ALC system.

Introduction

5.5.1 The Ground Conditions and Land Quality chapter presents the potential effects of the Proposed Development on ground conditions and land quality during construction, operation and maintenance, and decommissioning. The assessment considers soil resources, agricultural land quality, land stability, hydrogeology and land contamination, and identifies how potential risks are avoided or managed through design, embedded mitigation and environmental management plans.

Existing Baseline

5.5.2 The baseline conditions and potential contamination risks relating to ground conditions and land quality have been established in accordance with the Environment Agency's Land Contamination Risk Management (LCRM) guidance. This has been informed by a Phase 1 desk-based Environmental Site Assessment (ESA), also referred to as a Phase 1 Contaminated Land Report, which has been completed for the Proposed Development.

5.5.3 ALC surveys have been undertaken across the Site. The ALC system classifies land from Grade 1 (excellent quality) to Grade 5 (very poor quality), based on factors such as soil characteristics, climate, topography and drainage. Grades 1, 2 and Subgrade 3a are defined as BMV agricultural land and receive greater protection in planning policy than lower quality, non-BMV land (Subgrade 3b, Grades 4 and 5).

5.5.4 The ALC surveys demonstrate that the majority of soils within the Site are classified as Subgrade 3b (non-BMV), with more limited and localised areas of BMV land present. A summary of BMV land on site is presented in **Table 5.1**

Table 5.1 Summary of BMV land

BMV Status	Total Area* (Ha)	% of Total Site Area*
BMV	220	19%
Non-BMV	920	80%
Not-surveyed	10	1%
Total	**1,150**	**100%**

*areas are rounded to nearest whole number

5.5.5 Historical landfill sites and waste disposal activities have been reviewed using Envirocheck® data and other available records. While no active landfill sites are located within the Order Limits, the presence of potentially contaminated land remains a consideration.

5.5.6 Risks associated with historic coal mining have also been assessed. Mining Remediation Authority mapping identifies that parts of the Site are located within Coal Mining Reporting Areas, with localised High Risk Development Areas associated with past shallow mining and mine entries.

5.5.7 Phase 1 Coal Mining Risk Assessments have been informed by publicly available environmental data and Mining Remediation Authority datasets. These assessments identified areas where design measures, stand-off distances and, where necessary, targeted pre-construction investigations would be required to manage land stability risk.

What are the Ground Condition and Land Quality Effects and How are they Avoided or Managed?

Construction

5.5.8 Potential effects during the construction phase of the Proposed Development on ground conditions and land quality include:

- Permanent loss of soil function
- Soil compaction and changes to drainage and water infiltration
- Ground or groundwater contamination (including exposure to)
- Changes in Soil quality
- Groundwater quality and quantity
- Land stability effects on historically mined areas
- Construction on land affected by mining and landfilling; and
- Construction on land designated for mineral safeguarding.

5.5.9 Temporary soil compaction and changes to drainage patterns may occur in areas subject to vehicle and heavy plant movement, for example, access roads. Post-construction, the temporary working areas will be reinstated to the pre-existing conditions, where practicable. Less than 5ha of land is therefore proposed to be subject to permanent ground disturbance. In areas underlain by BMV soils, the potential significance of the temporary effect of soil compaction and changes to drainage patterns are assessed as **Significant**. In areas of non-BMV soils, these

effects are assessed as **Not Significant**. However, with embedded mitigation, permanent changes are anticipated to be minimal. As a result, the significance is reduced to **Negligible (Not Significant)**.

5.5.10 Agricultural Land Classification surveys have not been undertaken for the Cable Corridors, as the installation of cables would be temporary and the land would be reinstated and returned to its existing use following construction. Soil handling and reinstatement within the Cable Corridors will be managed through the CEMP, which will include a Soil Management Plan. On this basis, effects on soil function within the Cable Corridors are assessed as temporary, fully reversible and **Not Significant**.

5.5.11 During construction, additional mitigation is required for the following potential effects:

- Soil and / or groundwater quality (as a result of encountering contamination)
- Exposure to ground and / or groundwater quality; and
- Construction on land affected by mining and landfilling.

5.5.12 With additional mitigation, the significance of these effects is reduced to **Not Significant**. All other potential effects are assessed as **Not Significant** with the implementation of embedded mitigation and best-practice environmental controls. Both the embedded and additional mitigation will be secured through the CEMP and the SMP.

Operation and Maintenance

5.5.13 Potential effects during operation are anticipated to be similar to that of construction. When considering the embedded mitigation, the significance is anticipated to be the same as or less than the equivalent activities during construction. As with construction, additional mitigation is required for potential effects on soil and groundwater quality and on exposure to ground or groundwater contamination. During operation, additional mitigation will also be required for potential effects as a result of the migration and accumulation of mine gas. With the embedded and additional mitigation in place all potential effects associated with the operation of the Proposed Development are assessed as **Not Significant**. Both the embedded and additional mitigation implemented during operation will be secured through the OEMP.

Decommissioning

5.5.14 During decommissioning, the assessment assumes that activities broadly reverse the construction sequence. Above-ground infrastructure would be removed and the land restored to a condition suitable for agricultural use, while some below-ground elements such as cables, drains and foundations may remain in situ. Decommissioning effects on ground conditions and land quality are anticipated to be no greater than those identified for construction. A DEMP will be implemented which sets out the framework of mitigation measures to manage decommissioning activities and control potential effects on soils and ground conditions.

5.6 Water Resources and Flood Risk

Key Terms

Term	Explanation
Strategic Flood Risk Assessment (SFRA)	Collates information on all known sources of flooding that may affect existing or future development in a particular area.
Groundwater Interflow	Water that moves sideways through soil just below the surface after rainfall. It helps feed nearby streams and rivers without appearing as surface runoff.
Outline Surface Water Drainage Strategy	Sets out how surface water will be managed on-site to prevent flooding and pollution. It uses sustainable drainage methods to slow down and clean surface water runoff, ensuring water leaves the Site at pre-development rates.

Introduction

5.6.1 The Water Resources and Flood Risk chapter establishes baseline conditions relating to surface water, groundwater and flood risk within the Study Area. It assesses the potential effects of the construction, operation and maintenance, and decommissioning of the Proposed Development, and is informed by a Flood Risk Assessment and Water Framework Directive compliance assessment.

Existing Baseline

5.6.2 The baseline is informed by a desk-based review of national and local datasets such as EA flood risk mapping and catchment information, British Geological Survey (BGS) hydrogeological data, and Strategic Flood Risk Assessments. These datasets have been used to define and map baseline water resource and flood risk conditions.

5.6.3 The Study Area spans two water management catchments: the Don and Rother catchment and the Idle and Torne catchment, both of which form part of the Humber River Basin District. W2, together with small areas of W1 and W3, lie within the Idle and Torne catchment, with the remainder of the Site located within the Don and Rother catchment.

5.6.4 Most of the Study Area lies within Flood Zone 1, meaning it has a low probability of flooding from rivers or the sea (less than 0.1% annual probability). However, small areas associated with the River Rother, River Don, River Ryton and their tributaries fall within Flood Zones 2 and 3, which represent areas of medium and high flood risk. Flood Zones within W1, W2 and W3 are shown in **NTS Appendix 1, Figure 7: Flood Zones**.

What are the Water Resources and Flood Risk Effects and How are They Avoided or Managed?

Construction

5.6.5 During construction, the assessment identifies the potential effects including:

- Changes to surface water quality and quantity
- Changes to groundwater flows and interflow patterns
- Changes to the quality or quantity of water available for licensed abstractions and water supplies
- Alterations to surface water runoff, drainage patterns and flood risk; and
- Effects associated with potable water use and wastewater generation during construction activities, including potential interactions with public and private water supplies.

5.6.6 With the embedded mitigation in place, which will be secured through the CEMP and SWMP, the assessment concludes that effects during the construction phase on water resources and flood risk are **Not Significant**.

Operation and Maintenance

5.6.7 For the operation and maintenance phase, the assessment considers the following potential effects:

- Changes to surface water runoff, flood risk and surface water drainage patterns
- Effects on surface water quality within watercourses; and
- The potential for chemical pollution in the unlikely event of a battery fire at the Battery Energy Storage System.

5.6.8 During operation, the establishment of vegetation beneath the solar PV arrays is expected to improve runoff characteristics by increasing infiltration. Vegetated ground cover also slows the movement of sediment and agriculturally derived nutrients, helping to limit their transport into the wider catchment.

5.6.9 With embedded mitigation in place, the assessment concludes that operational effects on water resources and flood risk are **Not Significant**.

Decommissioning

5.6.10 During decommissioning, effects on water resources and flood risk are anticipated to be similar to those identified during construction, but of lower magnitude. Groundworks would be managed through a DEMP. As such, decommissioning effects are anticipated to be **Not Significant**.

5.7 Climate Change and Greenhouse Gas

Key Terms

Term	Explanation
Climate Change Risk and Resilience Assessment (CCRRA)	A process used to identify and evaluate how climate change might affect a project or area, including risks like flooding, extreme weather, or temperature changes.
Greenhouse Gas (GHG)	Gases such as carbon dioxide and methane that trap heat in the atmosphere and contribute to global warming. These are often measured to understand a project's environmental impact.
In-Combination Climate Impacts (ICCI)	The combined effect of climate change and other environmental pressures (like pollution or land use changes) that may increase risks or worsen impacts on people and nature.
Sulphur Hexafluoride (SF6)	A man-made gas commonly used in electrical equipment for insulation and arc suppression. It is extremely effective but also a potent greenhouse gas, with a global warming potential thousands of times greater than carbon dioxide. Its use is carefully managed to reduce environmental impact.

Introduction

5.7.1 The Climate Change and Greenhouse Gas Emissions chapter assesses how the Proposed Development interacts with climate change and GHG emissions. This includes consideration of climate change resilience, GHG emissions arising during construction, operation and maintenance, and decommissioning, and how future climate change could interact with other environmental effects.

Existing Baseline

5.7.2 Climate conditions within the Study Area are currently characterised by a temperate climate, with occasional warm periods and infrequent extreme heat events. Flooding can occur in low-lying areas during periods of heavy rainfall, particularly during intense storms, while overall water availability is moderate. Wind conditions are generally stable and the risk of wildfire is low.

5.7.3 The Climate Change Risk and Resilience Assessment uses current climate data, including global climate models, the Met Office and government datasets, to establish baseline conditions relating to temperature, rainfall, wind, drought and flood risk. This baseline provides a reference for assessing how future climate conditions may affect the resilience of the Proposed Development. Climate projections indicate increasing trends in extreme heat, extreme rainfall, flooding and periods of drought over the lifetime of the Proposed Development.

5.7.4 For greenhouse gases, the baseline assumes that the Proposed Development is not implemented. In this scenario, electricity would continue to be generated from more carbon-intensive sources. This baseline is used to assess both the GHG

emissions associated with the Proposed Development and the emissions that would be avoided through renewable electricity generation.

What are the Climate Change and Greenhouse Gas Effects and How are They Avoided or Managed?

Climate Change Risk and Resilience Assessment

5.7.5 The Climate Change Risk and Resilience Assessment considers the potential effects of future climate change hazards on the Proposed Development during the construction, operation and maintenance, and decommissioning phases. The assessment concludes that the effects of climate change hazards on the resilience and operation of the Proposed Development are **Not Significant**.

5.7.6 During the construction phase, embedded mitigation measures to manage climate-related risks will include:

- Management of heat risks for construction workers through health and safety procedures set out in a Health and Safety Plan; and
- Measures within the CEMP to manage potential flooding during construction, including maintaining safe access to the Site.

5.7.7 During the operation and maintenance phase, embedded mitigation measures include:

- Design standards for solar PV modules, substations and battery storage systems that account for elevated temperatures, together with maintenance procedures to manage overheating and fire risk
- Siting and design of infrastructure to minimise flood risk, including elevated equipment where appropriate and consideration of flood risk information
- Resilience to heavy rainfall events through design measures that limit disruption to power generation
- Infrastructure designed to withstand wind speeds in excess of those projected under future climate scenarios
- Use of closed-loop cooling systems such that drought conditions are unlikely to affect system performance
- Adaptive landscape and habitat management measures secured through the OEMP; and
- Wildfire risk, which is assessed as low, managed through standard fire prevention and response planning.

5.7.8 During decommissioning, potential effects associated with climate change hazards are anticipated to be similar to, or lower than, those during construction. Mitigation measures will be implemented through the DEMP, which will manage Site closure and restoration activities in accordance with relevant legislation at the time. On this basis, climate change effects during decommissioning are assessed as **Not Significant**.

Greenhouse Gas Emissions

5.7.9 The construction, operation, maintenance, and decommissioning of the Proposed Development are expected to generate approximately 1,036,000 tonnes of

greenhouse gas emissions (CO_2e). These emissions account for less than 0.1% of the UK's Carbon Budgets, and as a result, the GHG emissions associated with the Proposed Development would be **Not Significant**.

5.7.10 Importantly, the Proposed Development will generate renewable electricity that would displace electricity otherwise generated from fossil fuel sources. Over its anticipated 60-year operational lifetime, the Proposed Development is expected to avoid an estimated 18 million tonnes of CO_2e compared to the equivalent generation using wholly natural gas. In comparison to the current average carbon footprint of power generation in hte UK, the Proposed Development would avoid an estimated 7 million tonnes of CO_2e over its lifespan. These avoidances show a substantial net reduction in greenhouse gas emissions. As a result, the Proposed Development would deliver an overall net climate benefit, giving rise to a **Significant Beneficial** effect.

5.7.11 Measures to further limit greenhouse gas emissions associated with the Proposed Development include, where practicable:

- Avoiding or limiting the use of equipment containing high global-warming-potential gases, such as SF6
- The use of low-emission vehicles and generators, including electric vehicles and solar-powered lighting; and
- Recycling waste locally and re-using soil and materials on-site to reduce the need for new raw materials.

5.7.12 Together, these measures help to minimise the greenhouse gas emissions associated with the Proposed Development and support its contribution towards the UK's transition to a low-carbon energy system.

In-Combination Climate Impact Assessment (ICCI)

5.7.13 The aim of the ICCI Assessment is to determine if the impacts of the Proposed Development on environmental receptors would be significantly different under projected future climate conditions in comparison to existing conditions. In-combination climate impacts during the construction, operation and maintenance, and decommissioning phases have been assessed as **Not Significant**.

5.8 Air Quality

Key Terms

Term	Explanation
Air Quality Management Area (AQMA)	A place where air pollution levels are too high, usually due to traffic or industry. When this happens, the local council must declare it an AQMA and create a plan to reduce pollution and protect public health
Institute of Air Quality Management (IAQM)	The UK's professional body for air quality experts. It supports and promotes high standards in air quality science, policy, and practice.
Nationally Designated Ecological	A protected area in the UK that's been officially recognised for its important wildlife, habitats, or natural features.
Dust Risk Assessment	A dust risk assessment is a process used to evaluate the potential for dust emissions from construction or demolition activities. It helps identify the level of risk to nearby people, properties, and the environment. Based on the findings, measures are put in place to control dust and reduce its impact on air quality and health.
Design Manual for Roads and Bridges	A set of guidelines used in the UK for designing, building, and maintaining roads and bridges. It ensures that transport infrastructure is safe, efficient, and environmentally responsible.

Introduction

5.8.1 The Air Quality chapter assesses the potential effects of the Proposed Development on air quality during construction and decommissioning. Effects during the operation and maintenance phase were scoped out of the assessment because operational traffic is minimal and there are no on-site combustion sources.

Existing Baseline

5.8.2 Baseline air quality conditions were established using publicly available data from Department for Environment Food and Rural Affairs (DEFRA) and local authority monitoring. Air quality within the Study Area is generally good, with concentrations of key pollutants well below national air quality standards.

5.8.3 The Proposed Development lies partly within Rotherham AQMA No. 1 – Part 1 (NO_2), although only a very small area of the Site (approximately 36ha) falls within this designation. Other nearby AQMAs include Doncaster AQMAs No. 2 and No. 5, which are located on routes that construction traffic may use. Monitoring data show a general downward trend in nitrogen dioxide concentrations within these AQMAs, with recent measurements below the relevant air quality standards.

5.8.4 No nationally designated ecological sites are located within 250m of the Order Limits. Some designated sites are located within 200m of construction traffic routes, and these have been considered as part of the assessment.

What are the Air Quality Effects and How are They Avoided or Managed?

Construction

5.8.5 Potential construction-phase effects relate to:

- Dust from earthworks and construction activities; and
- Emissions from construction traffic.

5.8.6 A screening-level dust risk assessment was undertaken using IAQM guidance. With the application of standard dust control measures managed through the CEMP, construction dust impacts are assessed as **Not Significant**, for both human health and ecological receptors.

5.8.7 Construction traffic was assessed using IAQM, DEFRA and Design Manual for Roads and Bridges (DMRB) screening criteria. Consideration of traffic volumes, duration of construction and improving background air quality mean that effects on air quality would be Negligible. As such, construction traffic effects on air quality are **Not Significant**.

Decommissioning

5.8.8 Air quality effects during decommissioning are expected to be similar to, or less than, those during construction. With appropriate mitigation measures implemented through the DEMP, dust and traffic-related impacts during decommissioning are predicted to be **Not Significant**.

5.9 Traffic and Transport

Key Terms

Term	Explanation
Automatic Traffic Counts (ATCs)	A survey method of counting vehicles travelling along a section of road, with the use of cameras and/or cables placed along the road surface.
Construction Traffic Management Plan (CTMP)	A document that sets out how traffic will be managed on and around a construction site to ensure safety and minimise disruption.
Public Rights of Ways (PRoWs)	Legally protected routes where the public have the right to pass through, commonly on private land. Landowners are required to keep routes clear and accessible.
Public Rights of Way Management Plan (PRoWMP)	A document that sets out how public rights of way will be maintained and managed during construction, operation and decommission of the Proposed Development.

Introduction

5.9.1 The Traffic and Transport chapter assesses the potential effects of the Proposed Development on the surrounding transport network during the construction phase. Potential effects during the operation and maintenance phase have not been assessed as it is considered that there will be negligible levels of traffic during operation which will be limited to occasional maintenance visits by service vehicles. Furthermore, as it is not possible to accurately forecast future traffic levels 60 years into the future, potential effects during decommissioning have not yet been assessed. Instead, a traffic assessment will be undertaken at the time of decommissioning.

Existing Baseline

5.9.2 Baseline traffic and transport conditions have been established using a combination of desk-based information and site-specific data collection. This includes Department for Transport datasets, ATC surveys, collision records and mapping of the local highway network and Strategic Road Network. These data have been used to characterise existing traffic flows, road safety conditions and prevailing travel patterns in the area surrounding the Proposed Development.

5.9.3 The baseline also considers the presence and use of PRoWs and other routes used by non-motorised users, including pedestrians, cyclists and equestrians. The Study Area includes both rural and urban road environments, reflecting the varied character of the local transport network across W1, W2 and W3. Major routes within the Study Area include sections of the M1 and M18 motorways, along with A-class and B-class roads that provide access between the Strategic Road Network and the local highway network.

5.9.4 The Study Area has been defined as the roads that are expected to experience changes in traffic levels during the construction phase, based on likely access arrangements and proposed construction vehicle routing. Construction access

points and vehicle routes have been informed through consultation with the relevant local highway authorities and National Highways and are illustrated within **NTS Appendix 1, Figure 14: Traffic and Transport Study Area**.

What are the Traffic and Transport Effects and How are They Avoided or Managed?

Construction

5.9.5 Potential effects considered include impacts on severance (division of a community or loss of accessibility of amenities caused by separation from a main transport route), non-motorised user amenity and delay, fear and intimidation, and road user and pedestrian safety.

5.9.6 Mitigation measures to manage construction traffic effects are secured through a CTMP. The CTMP sets out measures to manage construction vehicle routing, access arrangements, delivery scheduling, abnormal load movements, workforce travel and traffic safety. Some key measures include avoiding peak times for the public where possible, phased construction resulting in no one area receiving high concentrations of traffic, and strict traffic controls to minimise potential impacts on road safety.

5.9.7 Potential effects on PRoWs and other non-motorised users would be managed through a PRoWMP. This plan establishes the framework for managing temporary diversions, maintaining safe access and minimising disruption to pedestrians, cyclists and equestrians during construction.

5.9.8 With the implementation of the mitigation measures, the assessment concludes that construction-phase traffic and transport effects would be **Not Significant**.

5.10 Noise and Vibration

Key Terms

Term	Explanation
Daytime Noise	Noise levels from 0700 hrs to 1900 hrs
Evening Noise	Noise levels from 1900 hrs to 2300 hrs.
Nighttime Noise	Noise levels from 2300 hrs to 0700 hrs
Noise Sensitive Receptors	Places where people or wildlife could be disturbed or harmed by high noise levels. These typically include homes, schools, hospitals, care homes, and nature reserves.

Introduction

5.10.1 The Noise and Vibration chapter assesses the potential effects of noise and vibration arising from the construction, operation and maintenance, and decommissioning of the Proposed Development on nearby noise-sensitive receptors, such as residential properties.

Existing Baseline

5.10.2 To establish the existing noise environment, sound level monitoring was undertaken at 24 monitoring locations across the Study Area. Noise levels were measured continuously during daytime, evening and night-time periods over a minimum seven-day period at each location. The locations of these monitoring sites are shown in **NTS Appendix 1, Figures 15, 16 and 17: Noise Monitoring Locations**.

5.10.3 The baseline acoustic environment is predominantly influenced by road traffic noise from major routes, including the M1, M18 and A57. In areas more distant from these transport corridors, baseline noise levels are typically characterised by quieter conditions, comprising local road traffic, railway activity in some locations, rural background sounds and agricultural activity.

What Are the Noise and Vibration Effects and How Are They Avoided or Managed?

Construction

5.10.4 During construction, noise and vibration would arise from activities such as earthworks, installation of solar infrastructure, substations and cabling, and construction traffic. Construction activities would be temporary and localised, with works moving along the Site and Cable Corridors over time. It is concluded that Major noise impacts would be restricted to very brief periods. Taking account of duration, scale and mitigation, construction noise and vibration effects are assessed as **Not Significant**.

5.10.5 Mitigation measures to manage construction noise and vibration effects are managed through a CEMP. The CEMP sets out the principles and measures to

control construction noise and vibration, including working hours, plant selection, construction methods, monitoring and complaint response procedures.

5.10.6 Noise from off-site construction traffic has also been assessed. While some local increases in traffic noise could occur on specific routes, it is concluded that traffic-related noise effects would be **Not Significant**, partly due to existing background noise from major roads. These effects will be managed through a CTMP.

Operation and Maintenance

5.10.7 During operation, noise would primarily arise from fixed equipment such as power conversion systems, battery storage infrastructure and substations. It is concluded that, with the application of embedded design measures including appropriate siting, separation distances and noise attenuation where required, operational noise levels would comply with recognised guidance and avoid significant adverse effects. Overall, operational noise effects are assessed as **Not Significant**.

5.10.8 As the detailed design of the Proposed Development progresses, a project-specific operational noise assessment will be undertaken and submitted for approval prior to commencement of the relevant works, ensuring that operational noise mitigation is appropriately incorporated into the final detailed design.

5.10.9 Operational vibration effects have been scoped out of assessment, as the Proposed Development would not include equipment that would generate significant vibration during operation.

Decommissioning

5.10.10 Decommissioning activities are expected to be similar in nature to, but generally less intensive than, construction activities. Noise and vibration effects during decommissioning are therefore anticipated to be no worse than those identified for construction.

5.10.11 Mitigation measures to manage decommissioning noise and vibration effects will be secured via the DEMP. With these measures in place, decommissioning noise and vibration effects are assessed as **Not Significant**.

5.11 Socioeconomics, Tourism and Recreation, and Land Use

Key Terms

Term	Explanation
Office for National Statistics (ONS)	The UK's largest independent producer of official statistics. It collects and publishes data on the economy, population, and society.
Census Data	Information collected about the population and households in a country, usually every 10 years
Gross Value Added	A measure of the value of goods and services produced in an area, industry, or sector of the economy. It shows how much economic activity is happening, minus the costs of inputs and raw materials.
Public Rights of Way (PRoW)	Paths or tracks that the public has a legal right to use. These include footpaths, bridleways, and byways, and they often cross private land.

Introduction

5.11.1 The Socio-economics, Tourism and Recreation, and Land Use chapter assesses the potential effects of the construction, operation and maintenance, and decommissioning of the Proposed Development on socio-economic conditions, tourism and recreation, and land use.

Existing Baseline

5.11.2 Existing socio-economic, tourism and recreation, and land use conditions within the Study Areas have been defined using a desk-based review of published data, including information from the ONS, the Census, and ALC surveys. Effects are assessed at neighbourhood, local and national scales, with baseline data presented for Doncaster, Rotherham and England.

5.11.3 The local baseline indicates a number of socio-economic challenges. These include higher-than-average levels of unemployment and economic inactivity, a lower proportion of residents employed in higher-skilled professional occupations, and lower overall qualification levels compared to national averages. Average earnings in Doncaster and Rotherham are also below the England average, and a proportion of residents commute outside the area to access higher-paid employment.

5.11.4 Tourism is identified to make moderate contributions to the local economy. Tourism attractions within the Study Area include Conisbrough Castle, Gulliver's Valley Theme Park and the historic monument, Roche Abbey. Tourism accommodation is generally concentrated along motorway corridors and in urban centres, with the peak tourism period occurring during the summer time.

5.11.5 There is a strong network of PRoWs, including the Trans Pennine Trail which supports recreational walking and cycling. Other recreational areas identified include a number of country parks and community woodlands.

5.11.6 Land use within the Order Limits is predominantly for agricultural purposes where there are established arable and grassland farming areas. The Order Limits are largely composed of moderate-quality (non-BMV) soils, while BMV land is fragmented and comprises a minority of land within the Order Limits.

What are the Socio-economic, Tourism and Recreation, and Land Use Effects and How are They Avoided or Managed?

Construction

5.11.7 The construction of the Proposed Development would involve a substantial level of investment over a period of approximately 24 to 36 months. This investment would support employment and economic activity through direct construction jobs and through supply-chain spending on materials, equipment, transport and professional services. Construction activity would also generate Gross Value Added (GVA) through wages, business turnover and supply-chain activity.

5.11.8 While these jobs and expenditure would be temporary and over a relatively short period, the scale of construction activity relative to existing labour market conditions means that construction-phase employment and economic effects are assessed as Minor Beneficial and **Not Significant** at both the local and national levels.

5.11.9 Temporary effects on local communities may arise during construction due to an influx of construction workers, including short-term changes in local activity patterns and increased demand for services. However, given the temporary nature of construction and the expectation that most workers would commute from surrounding areas rather than relocate, these effects are assessed as **Not Significant**.

5.11.10 Users of PRoW and recreational routes close to the Site may experience temporary effects from the construction activity, vehicle movements and temporary changes to views. The Applicant will seek to minimise temporary closures or diversions of routes. The Site is not adjacent to any major tourism locations. Taking account of these factors and construction management measures, effects on tourism and recreation are assessed as **Not Significant**.

5.11.11 The construction of the Proposed Development would require the use of land within the Order Limits that is currently in agricultural use. The semi-permanent use of up to 133.8ha of BMV land would be required during the operation and maintenance phase, though some of that may be used for sheep grazing and therefore retain an agricultural role. The total area of BMV land required for substations, BESS and other infrastructure during the operation and maintenance phase would only be 0.4ha. Following decommissioning of the Proposed Development, the solar PV arrays, BESS and associated infrastructure would be removed, and the land would be returned and be available for use for arable farming. The Proposed Development is therefore expected to have a **Significant** effect on the availability of BMV land due to the reduced intensity of agricultural use during the operation and maintenance phase. It is important to note that this effect would be temporary and reversible.

Operation and Maintenance

5.11.12 During operation and maintenance, the Proposed Development would support a small number of permanent jobs associated and operational expenditure would generate a modest long-term contribution to GVA. Jobs would provide a long-term benefit, however the overall scale of employment and GVA is limited and the effect is assessed as Negligible **Beneficial** and **Not Significant**.

5.11.13 The Proposed Development is not expected to restrict access to PRoW or recreational assets during operation, and includes in its design new permissive paths for use during the lifetime of the Proposed Development. Although there would be long-term changes to the appearance of the landscape, assessments of landscape, visual and noise effects conclude that impacts on tourism and recreation users would be limited and appropriately managed. Overall effects on tourism and recreation during operation and maintenance are therefore **Not Significant**.

5.11.14 It is not expected that there would be any likely significant effects during the operation and maintenance phase to land use. Any loss of land arising continuing into the operation and maintenance phase is assessed as a long-term construction effect.

Decommissioning

5.11.15 Decommissioning effects on socio-economics, tourism and recreation, and land use are expected to be similar to, or less than, those experienced during construction. Decommissioning would generate short-term employment and economic activity, while land would be reinstated following removal of infrastructure. Overall effects during decommissioning are anticipated to be **Not Significant**.

5.12 Other Environmental Issues

Key Terms

Term	Explanation
Geometric Analysis (Glint and Glare)	A geometric analysis method used in a glint and glare assessment involves calculating the angles between reflective surfaces and observer viewpoints to determine whether sunlight reflections could cause visual discomfort or safety issues.

Introduction

5.12.1 The Other Environmental Topics chapter considers environmental topics that do not require individual standalone chapters. The topics assessed are:

- Waste
- Glint and Glare
- Telecommunications and Utilities
- Major Accidents and Disasters; and
- Electromagnetic Fields.

5.12.2 For each topic, the potential effects arising from the construction, operation and maintenance, and decommissioning of the Proposed Development are assessed.

What are the Other Environmental Issues Effects and How are they Avoided or Managed?

Waste

5.12.3 Waste effects are most relevant during the construction and decommissioning phases, when the greatest volumes of material would be generated. The principal receptor for the waste assessment is regional and national landfill capacity.

5.12.4 The majority of materials generated during construction, including soils and construction materials, would be re-used on Site or recycled, with only a small proportion requiring disposal to landfill.

5.12.5 During operation and maintenance, waste generation would be limited and associated with routine maintenance activities, such as replacement of small components.

5.12.6 During decommissioning, waste would largely comprise materials that are readily recyclable, including metals, cables and solar PV components.

5.12.7 Taking account of embedded mitigation, application of the waste hierarchy, and available landfill capacity, it is concluded that effects on the landfill capacity during construction, operation and maintenance, and decommissioning would be **Not Significant**.

5.12.8 Waste management measures are secured through a SWMP and a SMP. Operational wastes will be managed in accordance with the OEMP, while decommissioning waste will be managed in accordance with the DEMP.

Glint and Glare

5.12.9 Glint and glare refers to sunlight reflecting from solar PV modules and has the potential to affect visual receptors, including residents, users of roads and railways, PRoW, and aviation receptors.

5.12.10 Potential effects during construction and decommissioning were scoped out, as the solar PV arrays would not be present across the Site in their full operational form during these phases.

5.12.11 Embedded mitigation, including landscape planting, screening and management of vegetation, has been incorporated to reduce potential effects on sensitive receptors. These mitigation measures will be secured and implemented through the LEMP and refined as part of detailed post-consent design where required.

5.12.12 No effects above Low or None are anticipated for PRoWs or rail receptors. Solar reflections with the potential to cause a temporary after-image were predicted at Netherthorpe Airfield. However, at a lower tilt, this was reduced to a lower intensity, which is considered acceptable. A very small number of road receptors were identified as having Moderate impacts. Nine Moderate level impacts were identified for residential receptors. With the implementation of additional areas of screening and landscaping, it is concluded that these will be suitably reduced, and there are no glint and glare effects on road and rail or residential receptors. Proposed planting will reduce glare on some properties, however there would be a moderate effect on a few residential receptors during a certain number of hours in the year, dependent on weather conditions.

Telecommunications and Utilities

5.12.13 The Proposed Development would not interfere with above-ground telecommunications infrastructure, and no effects on these receptors are anticipated during the construction, operation and maintenance, or decommissioning phases.

5.12.14 There is, however, potential for interaction with underground utility receptors, including electricity, gas, water and wastewater infrastructure, during the construction and decommissioning phases. Embedded mitigation measures have therefore been incorporated into the design and will be implemented to safeguard these assets. These include:

- Consultation with statutory undertakers
- Identification of existing infrastructure prior to works
- Application of appropriate stand-off distances; and
- Protective design measures including:
  - Where cables would cross existing utilities, they would be laid 90 degrees (perpendicular) to the existing utilities; and
  - Cables would be installed at least 0.6m above or below existing utilities.

5.12.15 Embedded mitigation measures are secured through the CEMP and will be implemented via the CEMP. The DCO will include provisions to protect the

owners of telecommunication and utilities infrastructure. With these measures in place, effects on telecommunications and utilities receptors are assessed as **Not Significant**.

Major Accidents and Disasters

5.12.16 The Major Accidents and Disasters assessment considers both the vulnerability of the Proposed Development to such events and the potential for the Proposed Development to increase risks to human, environmental and infrastructure receptors.

5.12.17 The assessment draws on information relating to flood risk, ground conditions, climate change and transport. Events considered include flooding, fire, transport incidents, utilities failure, and other low-probability, high-consequence events.

5.12.18 Embedded mitigation measures and best-practice design standards have been incorporated to reduce risks, together with commitments to hazard and risk assessments as the design develops. With these measures in place, it is concluded that Major Accidents or Disasters during construction, operation and maintenance, or decommissioning of the Proposed Development are **Not Significant**.

Electromagnetic Fields

5.12.19 Electromagnetic Fields (EMFs) are produced by underground electricity cables when they are in use and are only relevant during the operation and maintenance phase of the Proposed Development.

Aquatic species

5.12.20 In line with the Scoping Opinion provided by the Planning Inspectorate, the Applicant has assessed the potential for EMF impacts on Aquatic species. Limited scientific evidence is available on the effects of EMFs on freshwater fish, with most research focusing on marine environments. Where effects have been reported, these are generally temporary behavioural responses, rather than physical harm. Migratory fish species present within the Study Area, including brown trout, European eel and other fish that live close to the riverbed, have been considered. Underground cables would cross watercourses; however these will be installed at depth below the river or stream bed, reducing potential exposure. Therefore, effects of EMFs on aquatic species are predicted to be **Not Significant**.

Public Rights of Way

5.12.21 People using PRoWs would only be exposed to EMFs for a very short time while passing over underground cables. This level of exposure would be much lower than that associated with many everyday household appliances. Effects of EMFs on PRoW users are therefore predicted to be **Not Significant**.

Residential receptors

5.12.22 There are no residential properties located within the Cable Corridors, although some homes are located nearby. Underground cables would be installed at depth and typically well away from property boundaries. Predicted EMF levels at residential locations would be well below UK Government and international

guideline limits. Effects of EMFs on residential receptors are therefore **Not Significant**.

Overall conclusion

5.12.23 The EMF assessment confirms that EMF levels from the Proposed Development would remain within recognised safety guidelines. As a result, no Significant Effects from EMFs are anticipated for people or wildlife.

5.13 Cumulative Effects

Introduction

5.13.1 The Cumulative Effects chapter presents the methodology of the cumulative effects assessment for the construction and operation and maintenance phases of the Proposed Development. The potential effects of decommissioning have been scoped out because it's too far in the future to predict what other developments might be happening at the same time, however this would be re-assessed prior to decommissioning. The chapter outlines the consultation carried out to date, describes the assessment methodology, provides relevant policy context, and summarises the next steps for the assessment of cumulative effects.

What are Cumulative Effects?

5.13.2 Cumulative effects are the combined impacts on the environment that can happen when:

- Multiple parts of a single project affect the same area or resource (known as intra-cumulative effects); or
- Other nearby projects or activities add to the impact of the Proposed Development (known as inter-cumulative effects).

5.13.3 Published guidance from the Planning Inspectorate and ISEP suggests a four-step method for evaluating inter-cumulative effects, which involves identifying potential other committed developments based on criteria related to their scale, location, and stage of development.

Intra-Cumulative Effects

5.13.4 Intra-cumulative effects occur when different aspects of the same development affect a single feature or location. For example, a public footpath might experience changes to views, increased noise, and light reflections, all caused by different parts of the same project.

There is a potential for the Proposed Development to lead to intra-cumulative effects on human health. Potential intra-cumulative effects on human health assessed as a part of the Environmental Impact Assessment are:

- Physical Activity
- Community Identify, Culture, Resilience and Influence
- Employment and Income
- Climate Change Mitigation and Adaptation
- Electromagnetic Fields
- Wider Societal Infrastructure and Resource; and
- Healthcare Services.

5.13.5 However, with the embedded mitigation measures, no significant intra-cumulative effects have been identified.

Inter Cumulative Effects

5.13.6 Inter cumulative effects occur when the Proposed Development and other nearby developments together influence the same feature. For instance, a local landscape might be affected not only by the Proposed Development but also by a nearby new housing development. Even if each effect is small on its own, together they can become more noticeable.

5.13.7 When considering the inter cumulative effects with other existing developments and/or approved developments, it has been assumed that standard and good practice mitigation measures will be applied to the developments (for example, use of construction environmental management plans).

Assessment of Cumulative Effects

5.13.8 The potential impacts of the Proposed Development may result in cumulative effects with impacts from other developments; however, this may not be the case for all impacts or receptors. For the Proposed Development to have cumulative effects on the same receptor(s) as other developments, the receptor(s) must be located within the relevant Zone of Influence (ZoI).

5.13.9 The ZoI for each technical topic has been defined by specialists in that field. These areas reflect where the Proposed Development could reasonably affect people, places, or environmental features relevant to each discipline. In assessing potential cumulative effects, technical experts have considered the type of impact and who or what might be affected. For instance, a nearby development might fall within the ZoI but still be excluded from consideration if there's no realistic way it could interact with the Proposed Development, such as when a dense urban area blocks any visual or environmental connection between the two.

5.13.10 The following ZoIs for each technical topic are set out in **Table 5.2** and can be viewed in **NTS Appendix 1, Figure 18: Cumulative Effects Assessment – Zones of Influence**.

5.13.11 A 'long list' of developments that could potentially interact with the Proposed Development has been compiled. This ensures that all developments with potential significant cumulative effects, when considered with the Proposed Development, are included in the environmental assessments.

5.13.12 The long list was then reviewed to identify which developments are likely to overlap in timing, such as having construction phases that coincide. The refined list is known as the 'short list' and includes the developments which are considered within the cumulative effects assessment.

5.13.13 The assessment of cumulative effects for the Proposed Development has been undertaken in consideration of each of the other developments identified in the short list, for each environmental topic included in the ES.

5.13.14 The cumulative effects assessment has been carried out using a precautionary approach, for example, it assumes that the construction of a project will overlap with that of the Proposed Development unless there is reasonable evidence to the contrary.

5.13.15 **Table 5.2** presents a summary of the inter cumulative effects in relation to each technical topic, including their ZoIs.

Table 5.2 Summary of Inter Cumulative Effects

ZoI	Inter-Cumulative Effects During Construction	Inter-Cumulative Effects During Operation and Maintenance
Biodiversity and Nature Conservation		
10km of the Order Limits	All inter-cumulative effects during construction were assessed as **Not Significant**.	All inter-cumulative effects during operation and maintenance were assessed as **Not Significant**.
Landscape and Visual		
10km of the Order Limits	All inter-cumulative effects during construction were assessed as **Not Significant**.	All inter-cumulative effects during operation and maintenance were assessed as **Not Significant**.
Cultural Heritage and Archaeology		
3km of the Order Limits	All inter-cumulative effects during construction were assessed as **Not Significant**.	All inter-cumulative effects during operation and maintenance were assessed as **Not Significant**.
Ground Conditions and Land Quality		
100m of the Order Limits	All inter-cumulative effects during construction were assessed as **Not Significant**.	All inter-cumulative effects during operation and maintenance were assessed as **Not Significant**.
Water Resources and Flood Risk		
1km of the Order Limits	All inter-cumulative effects during construction were assessed as **Not Significant**.	All inter-cumulative effects during operation and maintenance were assessed as **Not Significant**.
Climate Change and Greenhouse Gas		
Scoped out	N/A	N/A
Air Quality		
250m of the Order Limits	All inter-cumulative effects during construction were assessed as **Not Significant**	No inter-cumulative effects were identified.
Traffic and Transport		
The road network expected to experience an increase in traffic as a result of the construction of the Proposed Development	No inter-cumulative effects were identified.	N/A
Noise and Vibration		
500m of the Order Limits	All inter-cumulative effects during construction were assessed as **Not Significant**.	All inter-cumulative effects during operation and maintenance were assessed as **Not Significant**.
Socio-economics and Land Use		
The local administrative areas of CDC and RMBC	All inter-cumulative effects during construction were assessed as **Not Significant**.	All inter-cumulative effects during operation and maintenance were assessed as **Not Significant**.
Other Environmental Topics		

Waste		
Scoped out	N/A	N/A
Glint and Glare		
1km of the Order Limits	No inter-cumulative effects were identified.	No inter-cumulative effects were identified.
Major Accidents and Disasters		
Scoped out	N/A	N/A
Electromagnetic Fields		
Land within the Order Limits	N/A	All inter-cumulative effects during operation and maintenance were assessed as Not Significant.

6 SUMMARY AND CONCLUSIONS

6.1.1 In December 2024, the UK Government published the Clean Power 2030 Action Plan. A key aim on the Clean Power 2030 Action Plan is for renewable energy to produce 95% of the UK's power generation. To successfully deliver this, there is a significant need for investment in renewable energy infrastructure, for example, solar. In recognition of this, the UK Government has concluded that there is a critical national priority (CNP) for the provision of nationally significant low carbon infrastructure.

6.1.2 The Proposed Development involves the construction, operation and maintenance, and decommissioning of more than 100MW of solar PV arrays, BESS, onsite substations and supporting infrastructure, and grid connection infrastructure. The Proposed Development, is therefore, considered as a CNP project.

6.1.3 Once operational, the Proposed Development would avoid 18,000,000 tCO_2e of GHG emissions. The Proposed Development would, therefore, contribute significantly to the UK's legal commitment of reaching net zero by 2050.

6.1.4 The Applicant has committed to avoiding, reducing, or offsetting environmental effects during the construction, operation and maintenance, and decommissioning of the Proposed Development. Throughout the EIA process, this has included an iterative design process, actively engaging with consultees, and implementing embedded and additional mitigation measures.

6.1.5 During construction and decommissioning, **Significant** effects have been identified for landscape and visual receptors and for the temporary loss of the availability of BMV land. However, it is important to note that these effects have been reduced as far as practicable. The Applicant is also committed to ongoing efforts to continue to reduce these effects, where possible. All other potential effects associated with the construction and decommissioning of the Proposed Development are assessed as **Not Significant**.

6.1.6 During operation and maintenance, **Significant Beneficial** effects are identified for biodiversity and nature conservation in relation to habitat enhancement measures. The Proposed Development's displacement of GHG emissions is also expected to have a **Significant Beneficial** effect. As with construction, **Significant** effects have been identified for landscape and visual during operation and maintenance of the Proposed Development. However, these effects have been reduced as far as practicable, and the Applicant is also committed to ongoing efforts to continue to reduce these effects, where possible. All other potential effects associated with the operation and maintenance of the Proposed Development are assessed as **Not Significant**.

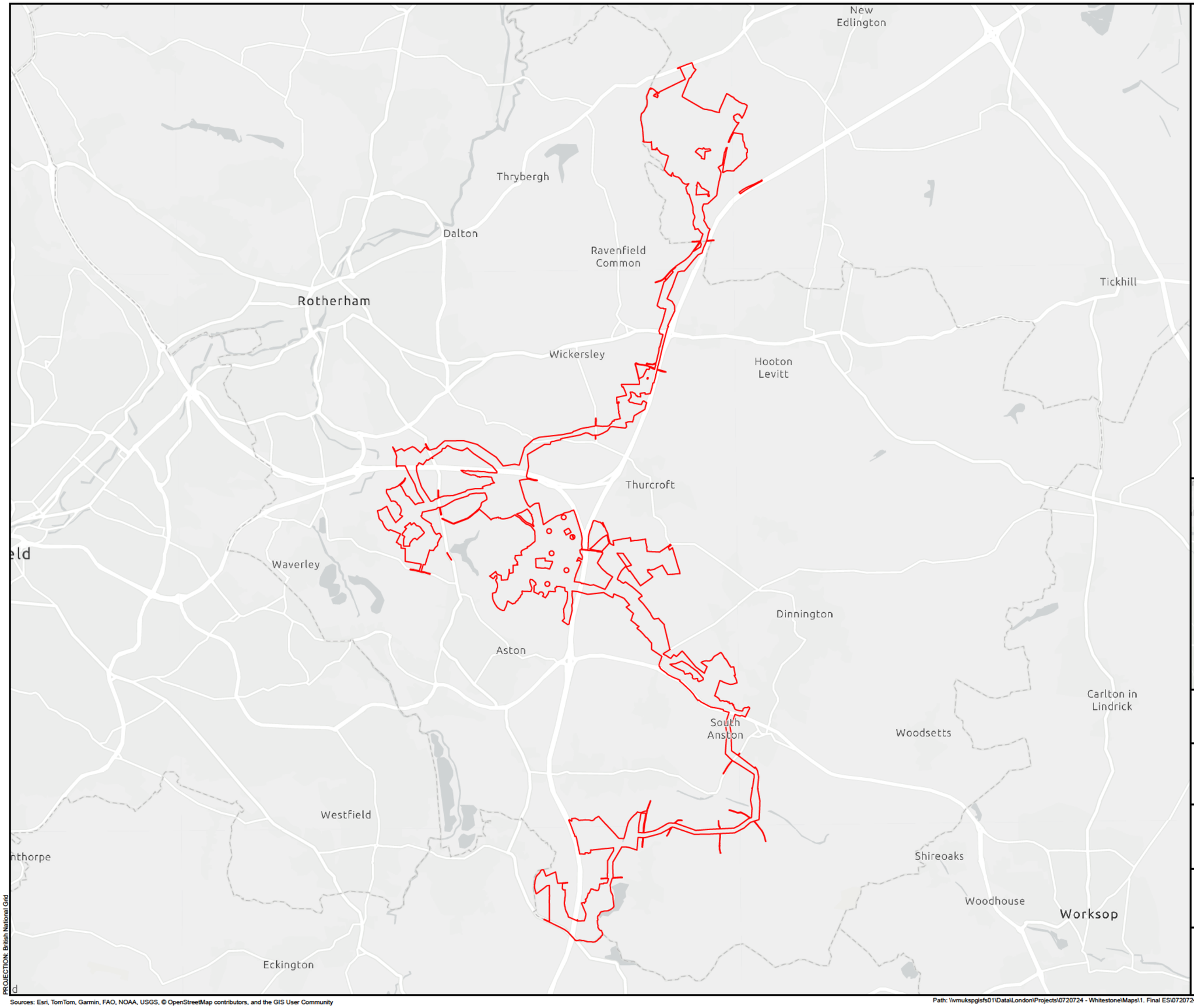
6.1.7 All cumulative effects for the Proposed Development and other projects are assessed as **Not Significant**.

References

[1] UK Government (2024) Clean Power 2030 Action Plan: A new era of clean electricity. [Online] Available at: https://www.gov.uk/government/publications/clean-power-2030-action-plan. (Accessed: August 2025)

[2] UK Government's Clean Power 2030 Action Plan. [Online] Available at: https://www.gov.uk/government/publications/clean-power-2030-action-plan (Accessed: September 2025)

Appendix 1: NTS Figures



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APPLICATION: EN0110020	CHECKED: HT
DATE: 27/05/2026	APPROVED: AH

Whitestone Solar Farm
Environmental Statement: Non-Technical Summary
Figure 1
Order Limits
Sheet 1 of 1

Reference: EN0110020/APP/6.21
Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 - Regulations 5(2)(a)

ERM

WHITESTONE solar farm

PROJECTION: British National Grid

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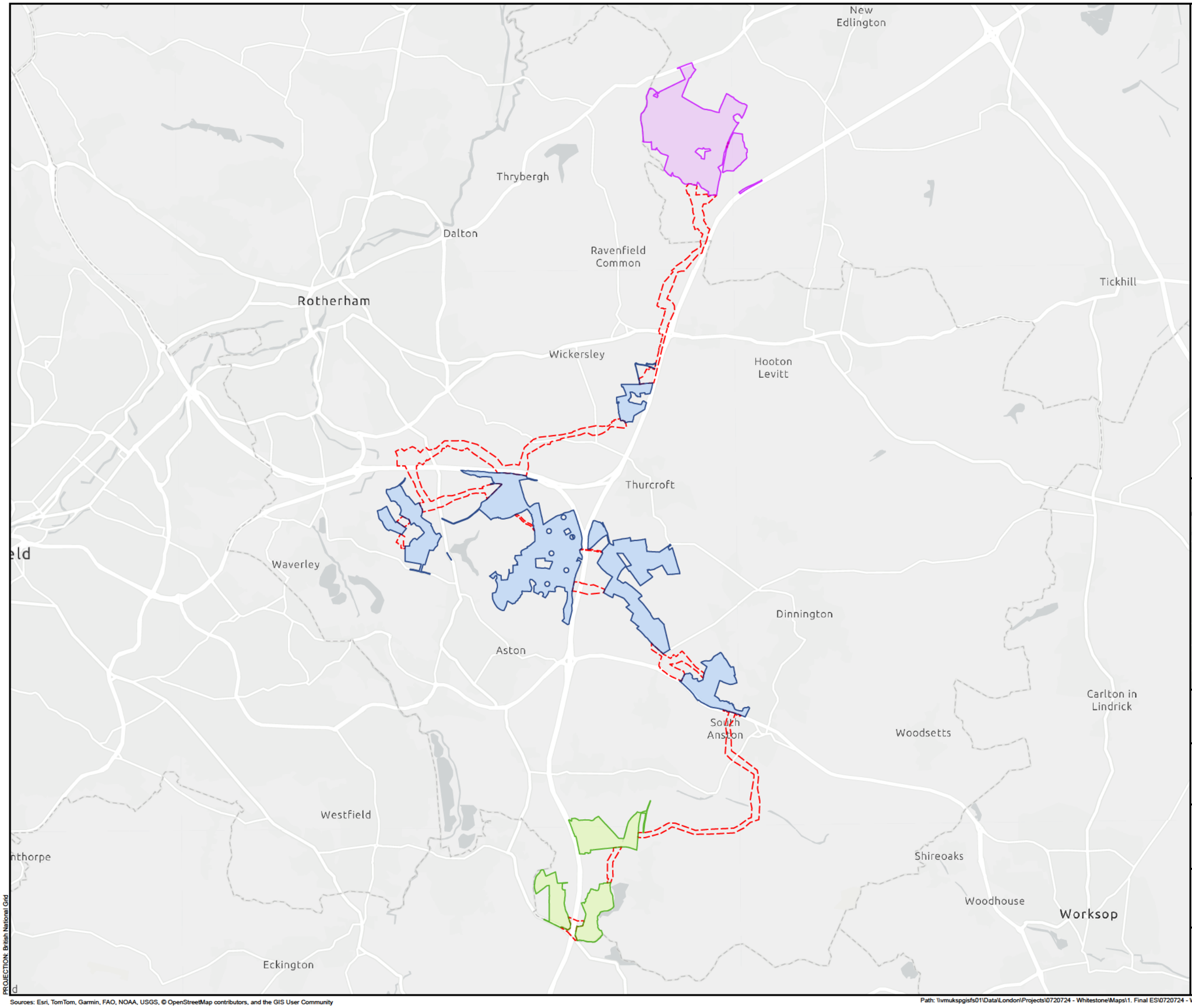
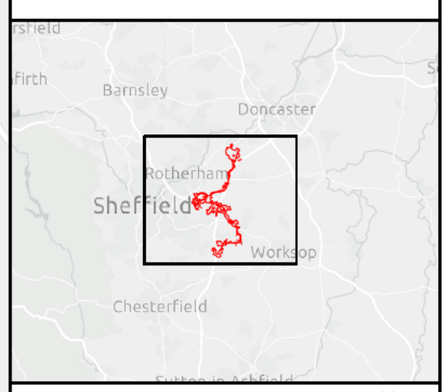


Site Boundary
- Whitestone 1
- Whitestone 2
- Whitestone 3
- Cable Corridor Route



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Whitestone Solar Farm
Environmental Statement: Non-Technical Summary
Figure 2
Site Referencing
Sheet 1 of 1

Reference: EN0110020/APP/6.21
Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 - Regulations 5(2)(a)

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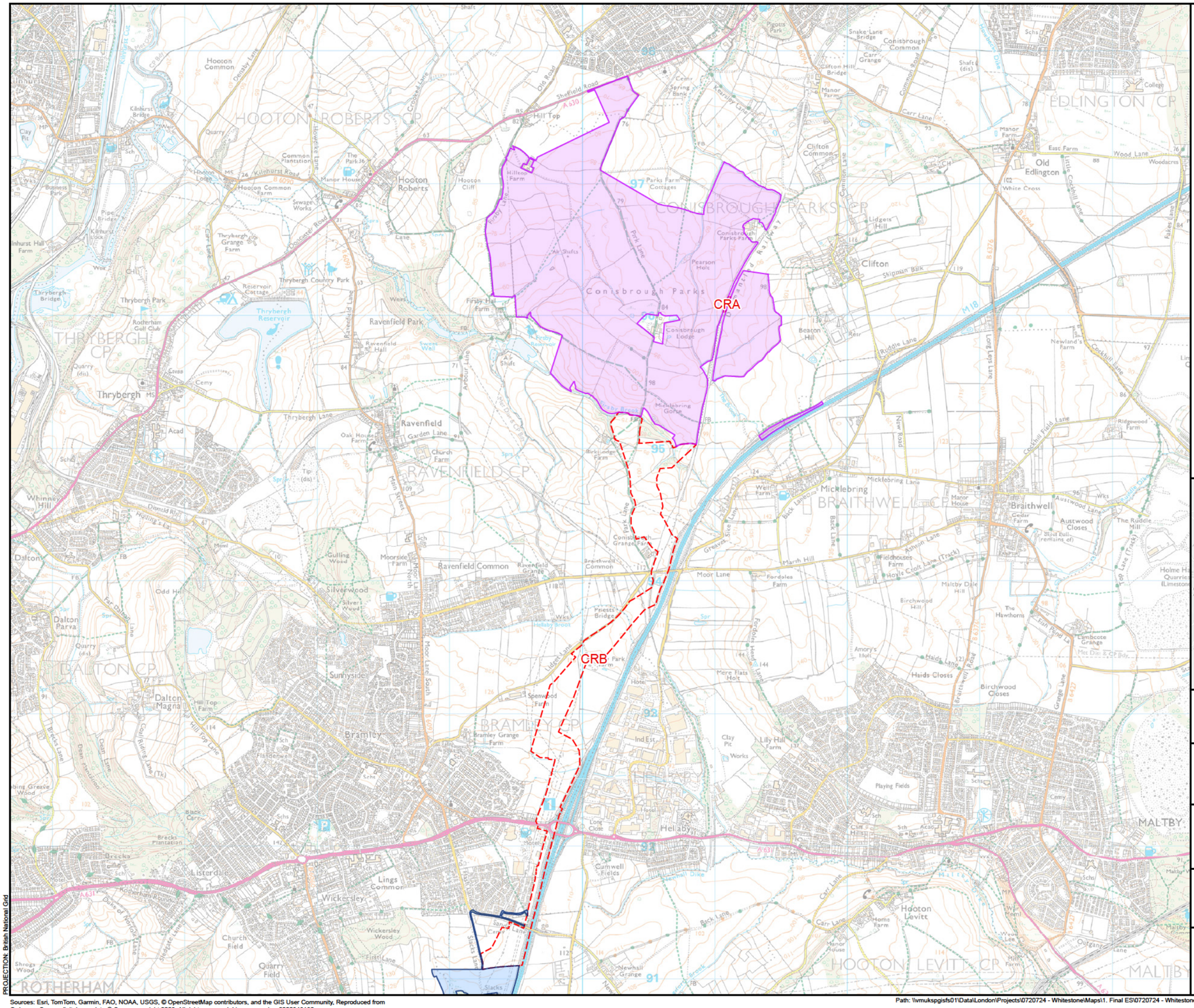

Site Boundary

- Whitestone 1
- Whitestone 2
- Cable Corridor Route

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Whitestone Solar Farm
Environmental Statement: Non-Technical Summary
Figure 3
Detailed Site Referencing
Sheet 1 of 3

Reference: EN0110020/APP/6.21
Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 - Regulations 5(2)(a)

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WHITESTONE solar farm

PROJECTION: British National Grid

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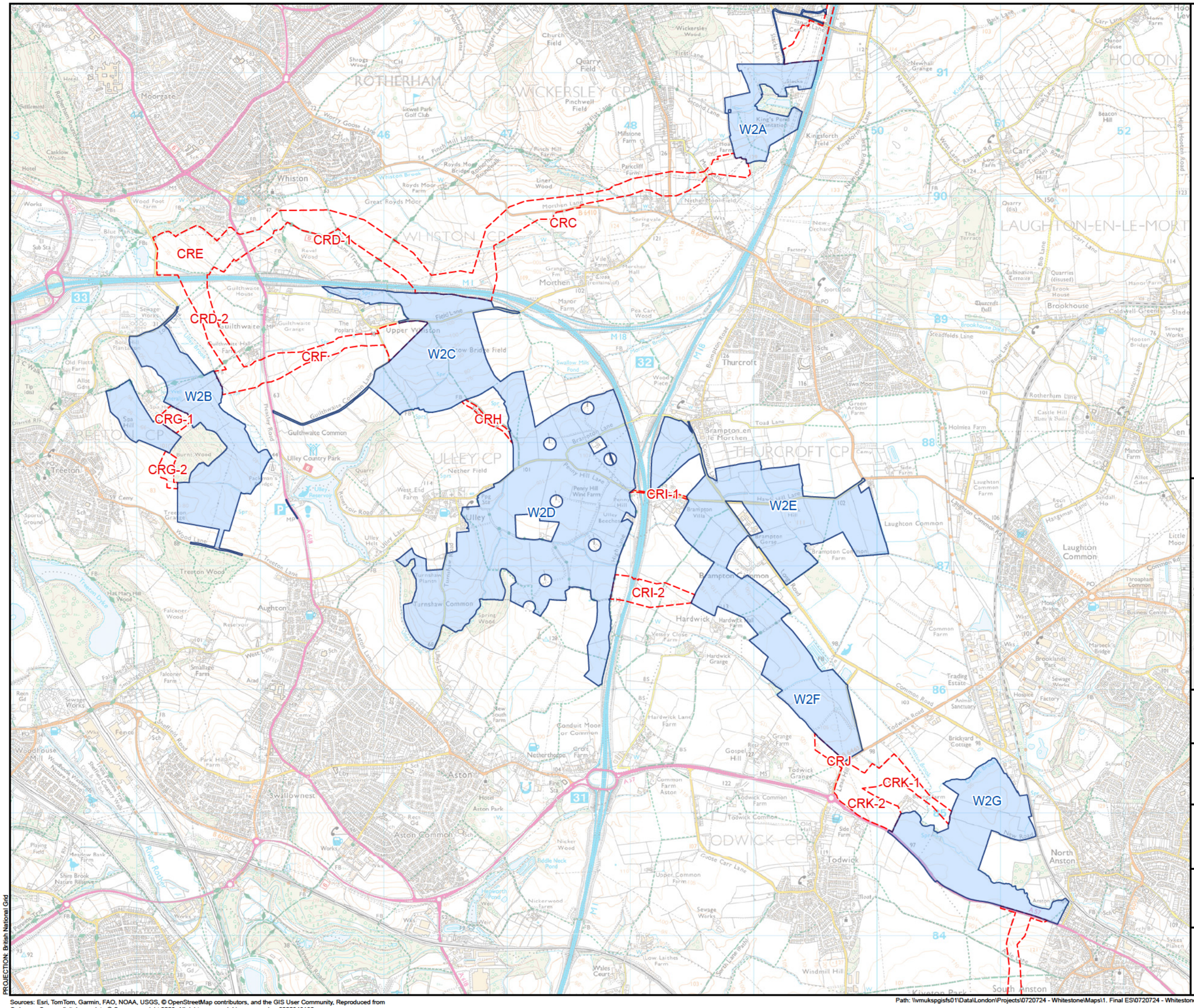

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Whitestone Solar Farm
Environmental Statement: Non-Technical Summary
Figure 3
Detailed Site Referencing
Sheet 2 of 3

Reference: EN0110020/APP/6.21
Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 - Regulations 5(2)(a)

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WHITESTONE solar farm

PROJECTION: British National Grid

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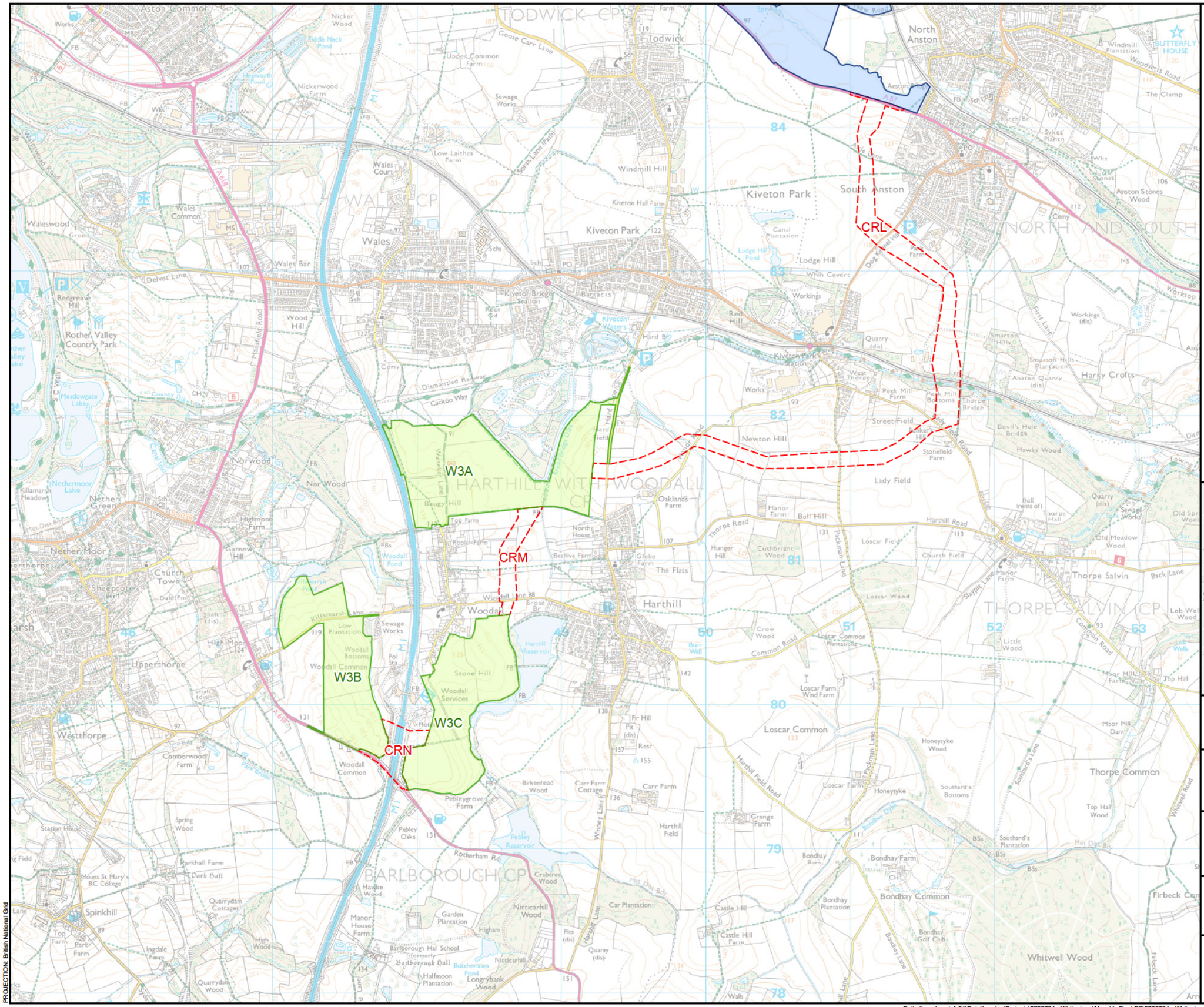

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Whitestone Solar Farm
Environmental Statement: Non-Technical Summary
Figure 3
Detailed Site Referencing
Sheet 3 of 3

Reference: EN0110020/APP/6.21
Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 - Regulations 5(2)(a)

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WHITESTONE solar farm

PROJECTION: British National Grid

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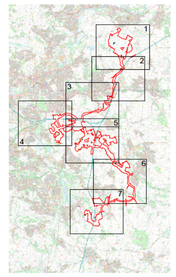
NOTES

1. ALL DIMENSIONS IN METRES UNLESS STATED OTHERWISE.
2. DO NOT SCALE FROM THIS DRAWING. USE ONLY PRINTED DIMENSIONS.
3. THE PROPOSED WORKS SHOWN ARE ILLUSTRATIVE ONLY AND WILL BE SUBJECT TO CHANGE AS PART OF DETAILED DESIGN DEVELOPMENT. ANY CHANGES WILL BE LIMITED TO BEING WITHIN THE ORDER LIMITS AND ANY OTHER CONSTRAINTS INCLUDED IN THE DEVELOPMENT CONSENT ORDER.

LEGEND

- Order Limits
- Proposed cable corridor
- Proposed solar panels and associated infrastructure
- Proposed substation, BESS and solar
- Proposed substation and solar
- Proposed site of new National Grid substation
- Existing Public Rights of Way
- Proposed permissive paths
- Existing hedgerows to be retained and enhanced
- Existing vegetation
- Proposed hedgerows
- Proposed hedgerows with trees
- Proposed scattered trees
- Proposed scrub
- Proposed wet woodland
- Proposed species-rich grassland seed mix
- Proposed tussock and grassland seed mix
- Areas retained and enhanced for biodiversity

SHEET PLAN



ISSUE	DATE	REMARKS	DRAWN	CHECK	APPROVED
01	June 2026	N/A	EJ	SG	SM

TITLE:

Illustrative Masterplan
Sheet 1 of 7
Whitestone Solar Farm
Regulation 5(2)(a)

DRAWING DATE: 01/06/2026

SCALE: 1:7500 | SHEET: Sheet 1 of 7

SIZE: A1 | REVISION: P01

DRAWING REFERENCE: EN0110020/APP/6.21

APPLICATION NUMBER: EN0110020

WHITESTONE solar farm

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LEGEND

- Order Limits
- Proposed cable corridor
- Proposed solar panels and associated infrastructure
- Proposed substation, BESS and solar
- Proposed substation and solar
- Proposed site of new National Grid substation
- Existing Public Rights of Way
- Proposed permissive paths
- Existing hedgerows to be retained and enhanced
- Existing vegetation
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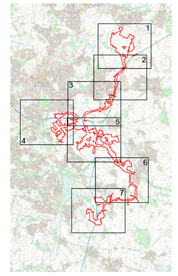
- Proposed hedgerows with trees
- Proposed scattered trees
- Proposed scrub
- Proposed wet woodland
- Proposed species-rich grassland seed mix
- Proposed tussock and grassland seed mix
- Areas retained and enhanced for biodiversity

SHEET PLAN



ISSUE	DATE	REMARKS	DRAWN	CHECK	APPROVED
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TITLE:

Illustrative Masterplan
Sheet 2 of 7
Whitestone Solar Farm
Regulation 5(2)(a)

DRAWING DATE: 01/06/2026

SCALE: 1:7500	SHEET: Sheet 2 of 7
SIZE: A1	REVISION: P01

DRAWING REFERENCE: EN0110020/APP/6.21

APPLICATION NUMBER: EN0110020

WHITESTONE solar farm

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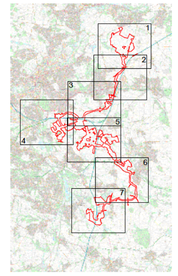
- Areas retained and enhanced for biodiversity

SHEET PLAN



ISSUE	DATE	REMARKS	DRAWN	CHECK	APPROVED
01	June 2026	N/A	EJ	SG	SM

TITLE:

Illustrative Masterplan
Sheet 3 of 7
Whitestone Solar Farm
Regulation 5(2)(a)

DRAWING DATE: 01/06/2026

SCALE: 1:7500	SHEET: Sheet 3 of 7
SIZE: A1	REVISION: P01

DRAWING REFERENCE: EN0110020/APP/6.21

APPLICATION NUMBER: EN0110020

WHITESTONE solar farm

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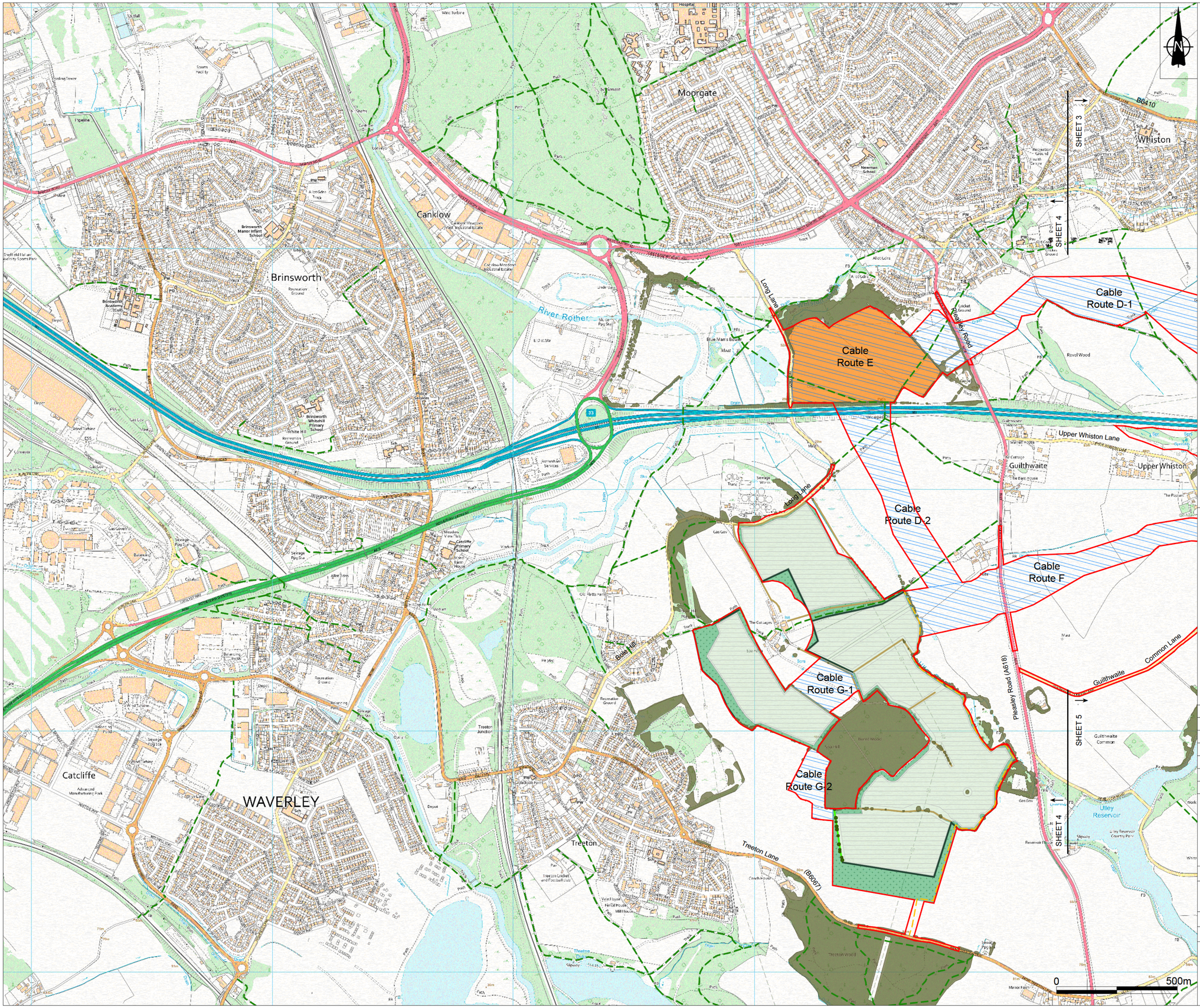

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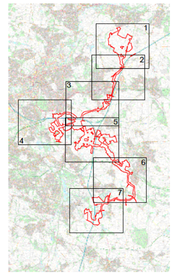
- Proposed species-rich grassland seed mix
- Proposed tussock and grassland seed mix
- Areas retained and enhanced for biodiversity

SHEET PLAN



01	June 2026	N/A	EJ	SG	SM
ISSUE	DATE	REMARKS	DRAWN	CHECK	APPROVED

TITLE:

Illustrative Masterplan
Sheet 4 of 7
Whitestone Solar Farm
Regulation 5(2)(a)

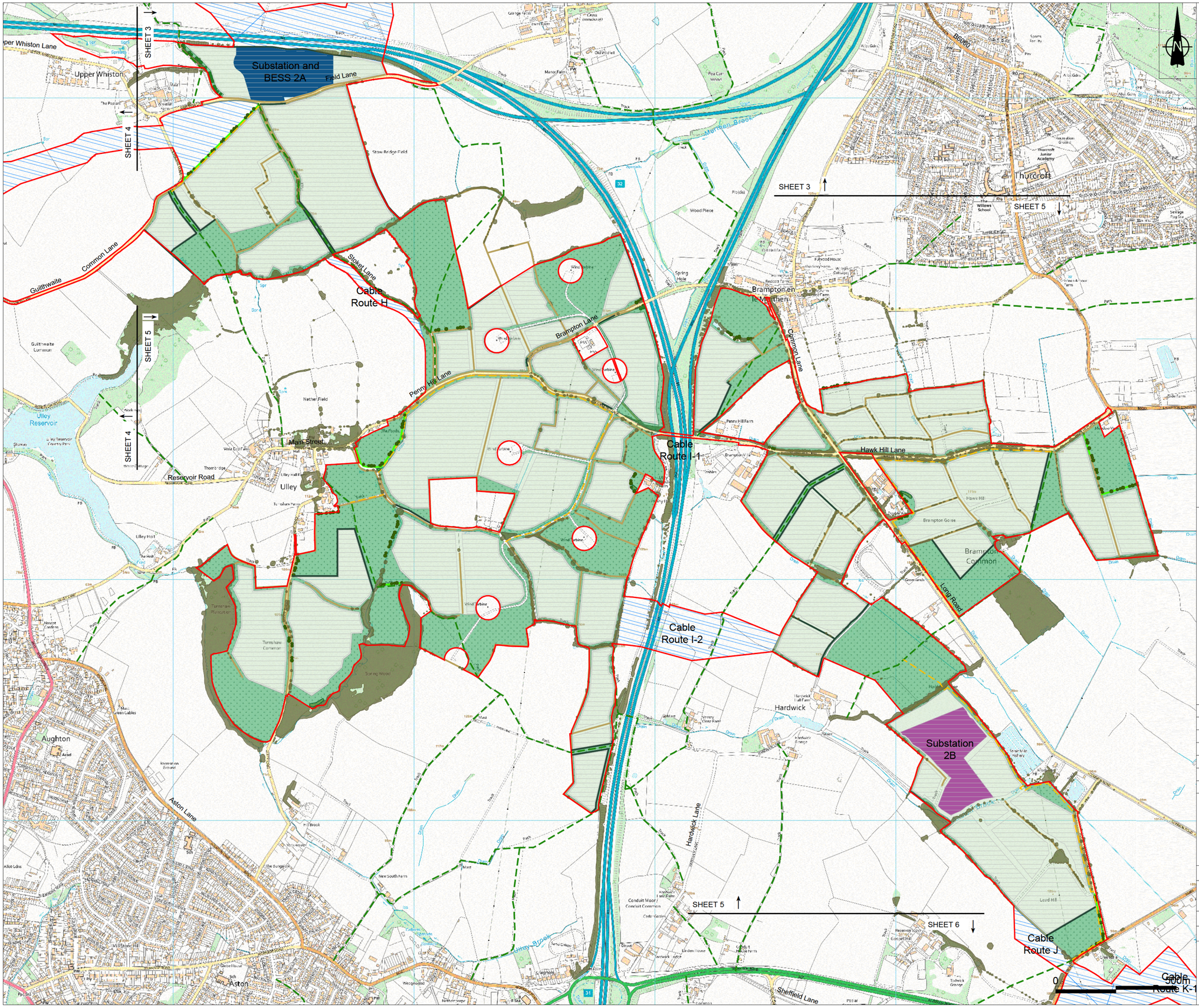
DRAWING DATE: 01/06/2026

SCALE: 1:7500	SHEET: Sheet 4 of 7
SIZE: A1	REVISION: P01

DRAWING REFERENCE: EN0110020/APP/6.21

APPLICATION NUMBER: EN0110020

WHITESTONE solar farm



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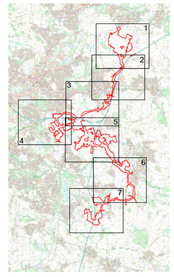
SHEET PLAN



ISSUE	DATE	REMARKS	DRAWN	CHECK	APPROVED
01	June 2026	N/A	EJ	SG	SM

TITLE:

Illustrative Masterplan
Sheet 5 of 7
Whitestone Solar Farm
Regulation 5(2)(a)

DRAWING DATE: 01/06/2026

SCALE: 1:7500	SHEET: Sheet 5 of 7
SIZE: A1	REVISION: P01

DRAWING REFERENCE: EN0110020/APP/6.21

APPLICATION NUMBER: EN0110020

WHITESTONE solar farm

Cable Route J

Cable Route K-1

Cable Route K-2

Cable Route L

SHEET 5

SHEET 6

SHEET 6

SHEET 7

Sheffield Lane

Goosecarr Lane

Todwick Common

Todwick

North Anston

South Anston

Kiveton Park

Wales

Kiveton Park Meadows Junior School

Wales High School

Anston Brook Primary School

Anston Hillcrest Primary School

Todwick Plantation

Windmill Hill

Kiveton Park

Canal Plantation

Lodge Hill

Lodge Hill Pond

Red Hill Plantation

Broad Bridge Dike

Pigeon Bridge Brook

Anston Brook

Crow Gate Hill

Sykes' Plantation

Thorpe Low Wood

Hawke Wood

Smarson Hills

Smarson Hills Plantation

Harry Crofts

Peck Mill Bottoms

Street Field

Lady Field

Hard Field

Hard Lane

Manor Road

Windmill Plantation

Greenfields Park

Recreation Ground

Skateboard Park

Cricket Ground

Golf Course

Quarry

Pylon

Sch

Track

Path

Drain

Stream

Pond

Lake

Mast

Pylons

Pylon

Pylon

Pylon

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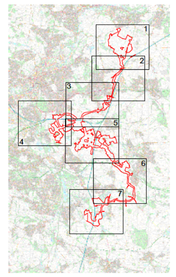

ISSUE	DATE	REMARKS	DRAWN	CHECK	APPROVED
01	June 2026	N/A	EJ	SG	SM

TITLE:

Illustrative Masterplan
Sheet 7 of 7
Whitestone Solar Farm
Regulation 5(2)(a)

DRAWING DATE: 01/06/2026

SCALE: 1:7500	SHEET: Sheet 7 of 7
SIZE: A1	REVISION: P01

DRAWING REFERENCE: EN0110020/APP/6.21

APPLICATION NUMBER: EN0110020

WHITESTONE solar farm

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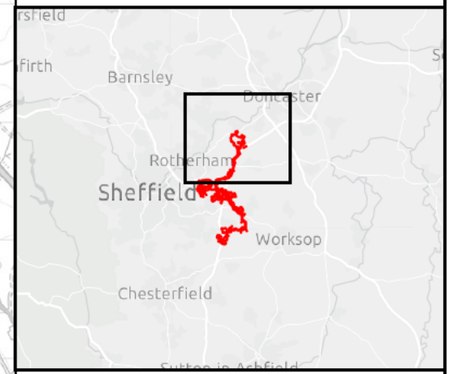
Order Limits
3 km Buffer of Order Limits
Private Receptors
Public Right of Way
National Cycle Network
Trans Pennine Trail

Long Distance Walking Routes (LDWR)

Don Valley Way
Rotherham Ring Route
South Yorkshire Way - Boundary Route
Rotherham Round Walk



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APPLICATION: EN0110020	CHECKED: NO
DATE: 5/28/2026	APPROVED: AH

Whitestone Solar Farm
Environmental Statement: Non-Technical Summary
Figure 5
Public Rights of Way and Other Recreational Receptors
Sheet 1 of 3

Reference: EN0110020/APP/6.21
Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 - Regulations 5(2)(a)

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WHITESTONE solar farm

PROJECTION: British National Grid

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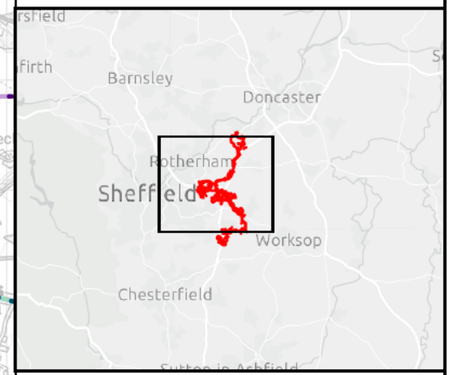
Path: \\vmukspgisfs01\Data\London\Projects\0720724 - Whitestone\Maps\1. Final ES\0720724 - Whitestone - Final ES - Intro.aprx\0720724 - WS - NTS - Figure 7 - Public Rights of Way and Other Recreational Receptors - A01

Order Limits
3 km Buffer of Order Limits
Private Receptors
Public Right of Way
National Cycle Network
Trans Pennine Trail

Long Distance Walking Routes (LDWR)

Cuckoo Way
Don Valley Way
Five Churches Walk
Rotherham Ring Route
South Yorkshire Way - Boundary Route
Rotherham Round Walk



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Metres

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DATE: 5/28/2026	APPROVED: AH

Whitestone Solar Farm
Environmental Statement: Non-Technical Summary
Figure 5
Public Rights of Way and Other Recreational Receptors
Sheet 2 of 3

Reference: EN0110020/APP/6.21
Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 - Regulations 5(2)(a)

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WHITESTONE solar farm

PROJECTION: British National Grid

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Order Limits
3 km Buffer of Order Limits
Private Receptors
Public Right of Way
National Cycle Network
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Long Distance Walking Routes (LDWR)

Cuckoo Way
Five Churches Walk
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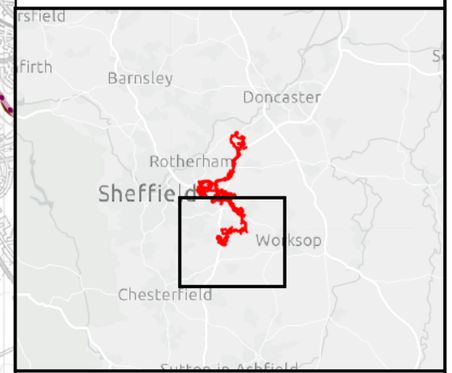

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Metres

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DATE: 5/28/2026	APPROVED: AH

Whitestone Solar Farm
Environmental Statement: Non-Technical Summary
Figure 5
Public Rights of Way and Other Recreational Receptors
Sheet 3 of 3

Reference: EN0110020/APP/6.21
Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 - Regulations 5(2)(a)

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WHITESTONE solar farm

PROJECTION: British National Grid

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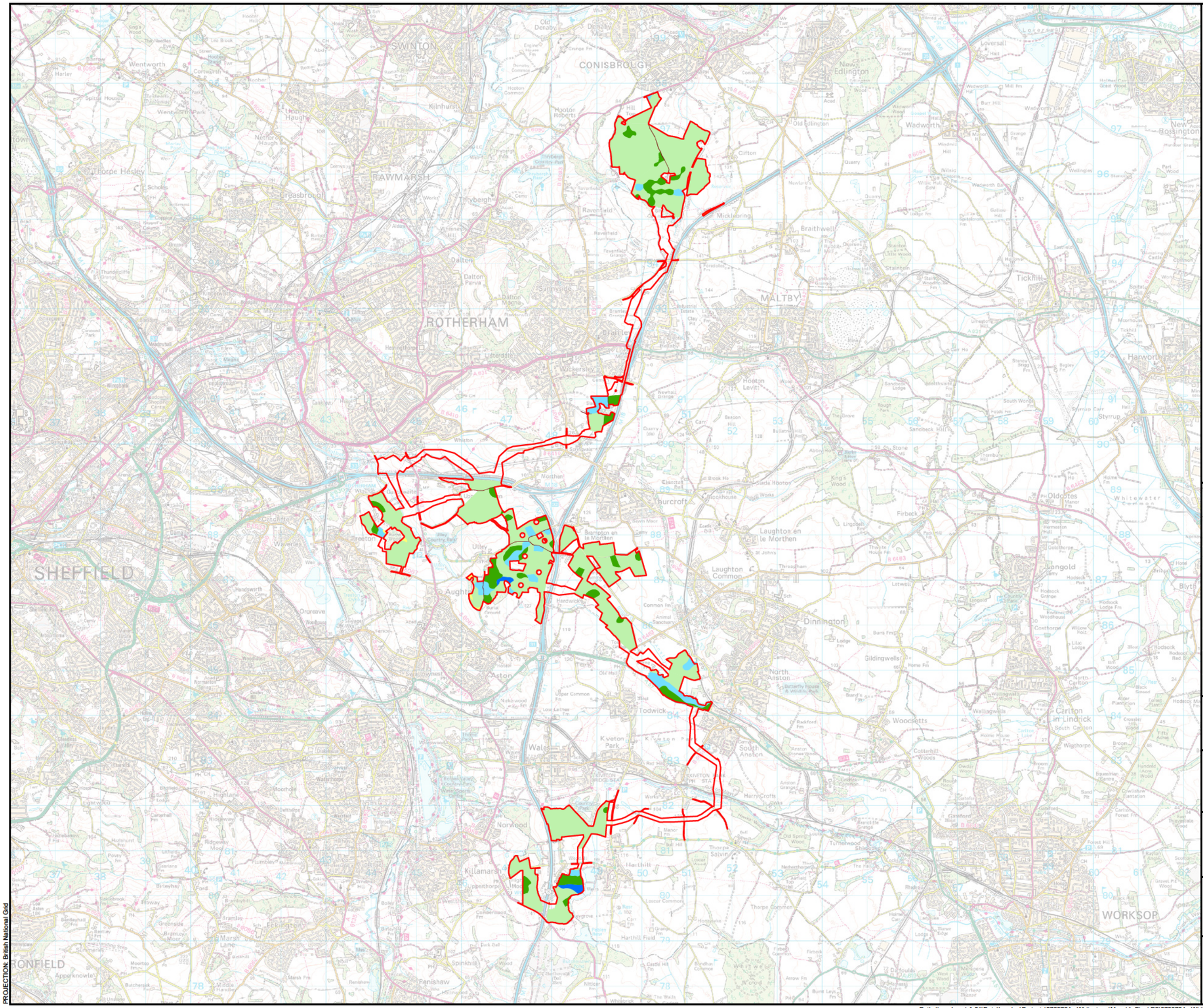

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APPLICATION: EN0110020	CHECKED: JR
DATE: 5/28/2026	APPROVED: AH

Whitestone Solar Farm
Environmental Statement: Non-Technical Summary
Figure 6
ALC Survey Results
Sheet 1 of 1

Reference: EN0110020/APP/6.21
Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 - Regulations 5(2)(a)

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WHITESTONE solar farm

PROJECTION: British National Grid

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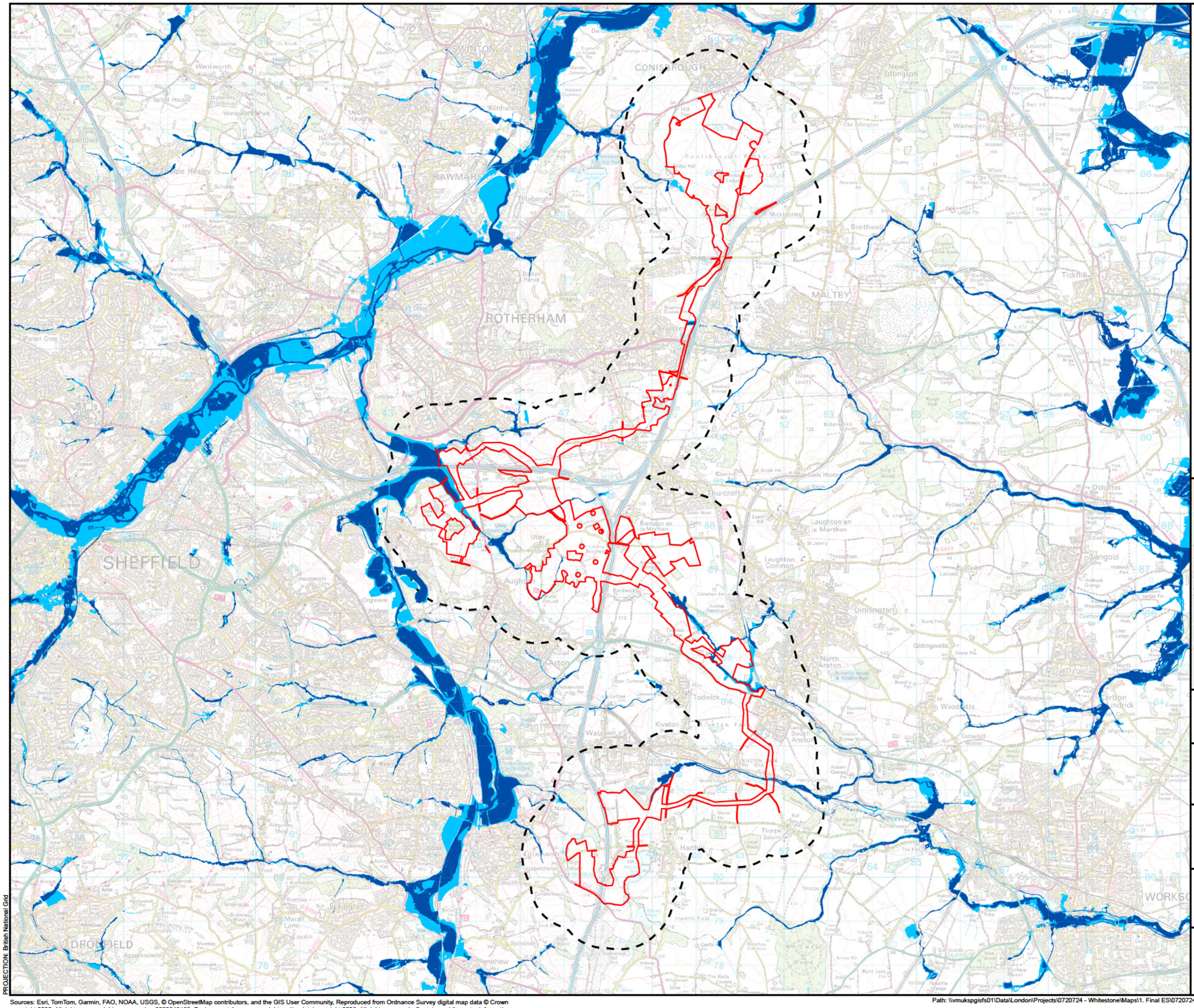

Order Limits

1 km Study Area

EA Flood Zones

Flood Zone 3

Flood Zone 2

0 1 2 3

Kilometres

N

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SIZE: A3	DRAWN: JS
APPLICATION: EN0110020	CHECKED: BM
DATE: 5/28/2026	APPROVED: AH

Whitestone Solar Farm
Environmental Statement: Non-Technical Summary
Figure 7
Flood Zones
Sheet 1 of 1

Reference: EN0110020/APP/6.21
Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 - Regulations 5(2)(a)

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WHITESTONE solar farm

PROJECTION: British National Grid

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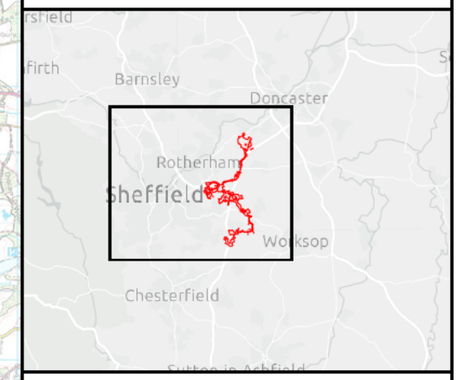
Order Limits
Point of Connection
12 km Study Area



0 1 2 3
Kilometres

N

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APPLICATION: EN0110020	CHECKED: HT
DATE: 5/28/2026	APPROVED: AH

Whitestone Solar Farm
Environmental Statement: Non-Technical Summary
Figure 8
12 km Search Area
Sheet 1 of 1

Reference: EN0110020/APP/6.21
Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 - Regulations 5(2)(a)

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WHITESTONE solar farm

PROJECTION: British National Grid

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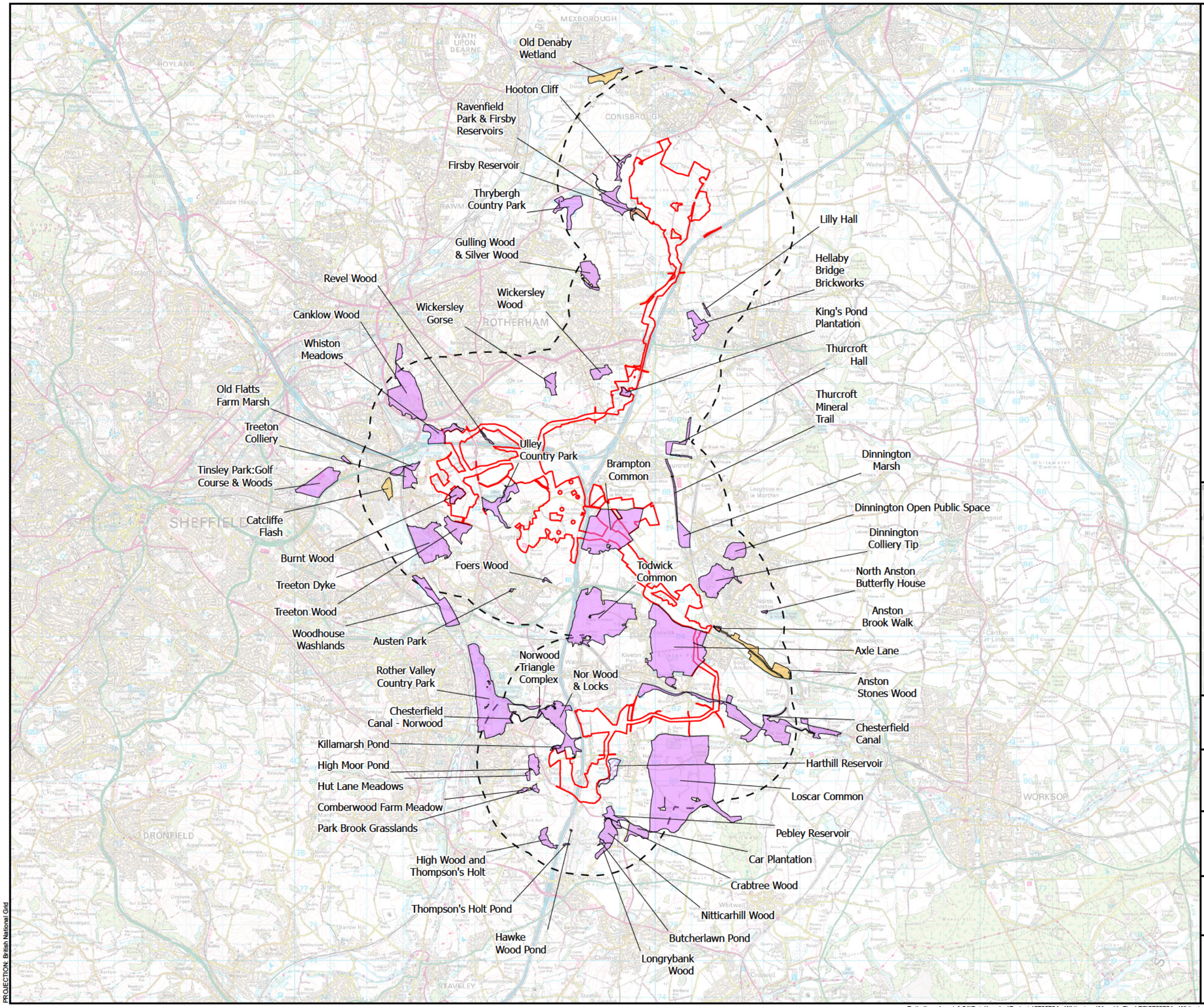

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DATE: 27/05/2026	APPROVED: AH

Whitestone Solar Farm
Environmental Statement: Non-Technical Summary
Figure 9
Local Designated Sites
Sheet 1 of 1

Reference: EN0110020/APP/6.21
Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 - Regulations 5(2)(a)

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WHITESTONE solar farm

PROJECTION: British National Grid

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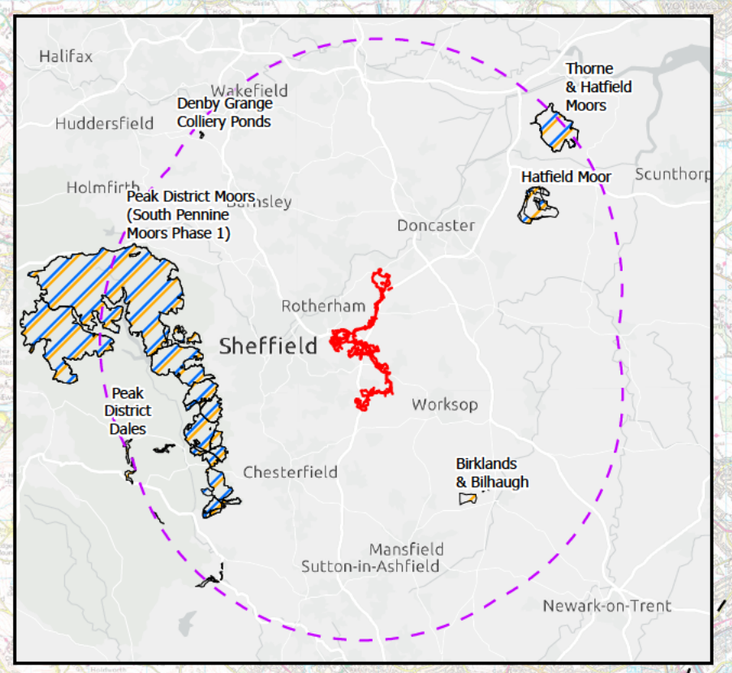
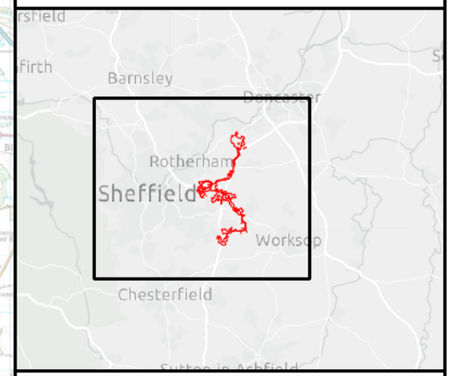


Denaby Ings
Cadeby Quarry
Sprotbrough
Gorge
New Edlington
Brickpit
Ashfield
Brick Pits
Edlington
Wood
Wood Lee
Common
Maltby Low
Common
Roche Abbey
Woodlands
Anston
Stones Wood
Lindrick
Golf Course
Moss Valley
Crabtree Wood
Ginny Spring,
Whitwell Wood

Order Limits
5 km Study Area
30 km Study Area
Special Protection Area
Special Area of Conservation
Site of Special Scientific Interest



0 1 2 3 4 5
Kilometres
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SIZE: A3	DRAWN: RW
APPLICATION: EN0110020	CHECKED: DH
DATE: 27/05/2026	APPROVED: AH

Whitestone Solar Farm
Environmental Statement: Non-Technical Summary
Figure 10
International and National Designated Sites
Sheet 1 of 1

Reference: EN0110020/APP/6.21
Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 - Regulations 5(2)(a)

ERM
WHITESTONE solar farm

PROJECTION: British National Grid

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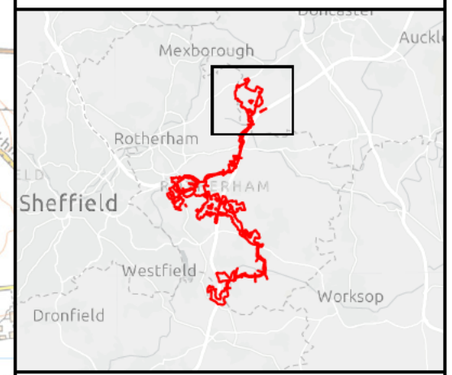
Order Limits

Viewpoint Location



0 200 400 600 800 1,000 Metres

N

SCALE: 1:20,000	VERSION: A02
SIZE: A3	DRAWN: RW
APPLICATION: EN0110020	CHECKED: NO
DATE: 27/05/2026	APPROVED: AH

Whitestone Solar Farm
Environmental Statement: Non-Technical Summary
Figure 11
Representative Viewpoints - W1
Sheet 1 of 1

Reference: EN0110020/APP/6.21
Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 - Regulations 5(2)(a)

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WHITESTONE solar farm

PROJECTION: British National Grid

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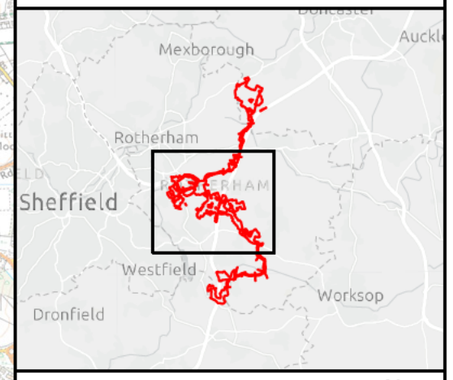
Order Limits

Viewpoint Location



0 200 400 600 800 1,000

Metres

N

SCALE: 1:30,000	VERSION: A02
SIZE: A3	DRAWN: RW
APPLICATION: EN0110020	CHECKED: NO
DATE: 27/05/2026	APPROVED: AH

Whitestone Solar Farm
Environmental Statement: Non-Technical Summary
Figure 12
Representative Viewpoints - W2
Sheet 1 of 1

Reference: EN0110020/APP/6.21
Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 - Regulations 5(2)(a)

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PROJECTION: British National Grid

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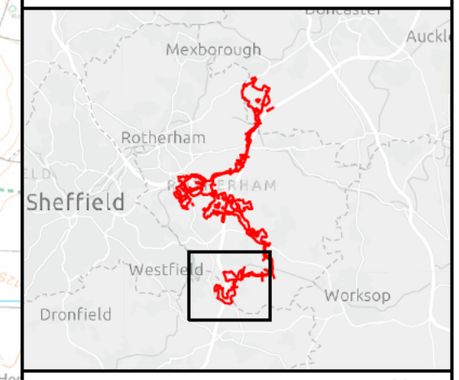
Order Limits

Viewpoint Location



0 200 400 600 800 1,000 Metres

N

SCALE: 1:20,000	VERSION: A02
SIZE: A3	DRAWN: RW
APPLICATION: EN0110020	CHECKED: NO
DATE: 27/05/2026	APPROVED: AH

Whitestone Solar Farm
Environmental Statement: Non-Technical Summary
Figure 13
Representative Viewpoints - W3
Sheet 1 of 1

Reference: EN0110020/APP/6.21
Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 - Regulations 5(2)(a)

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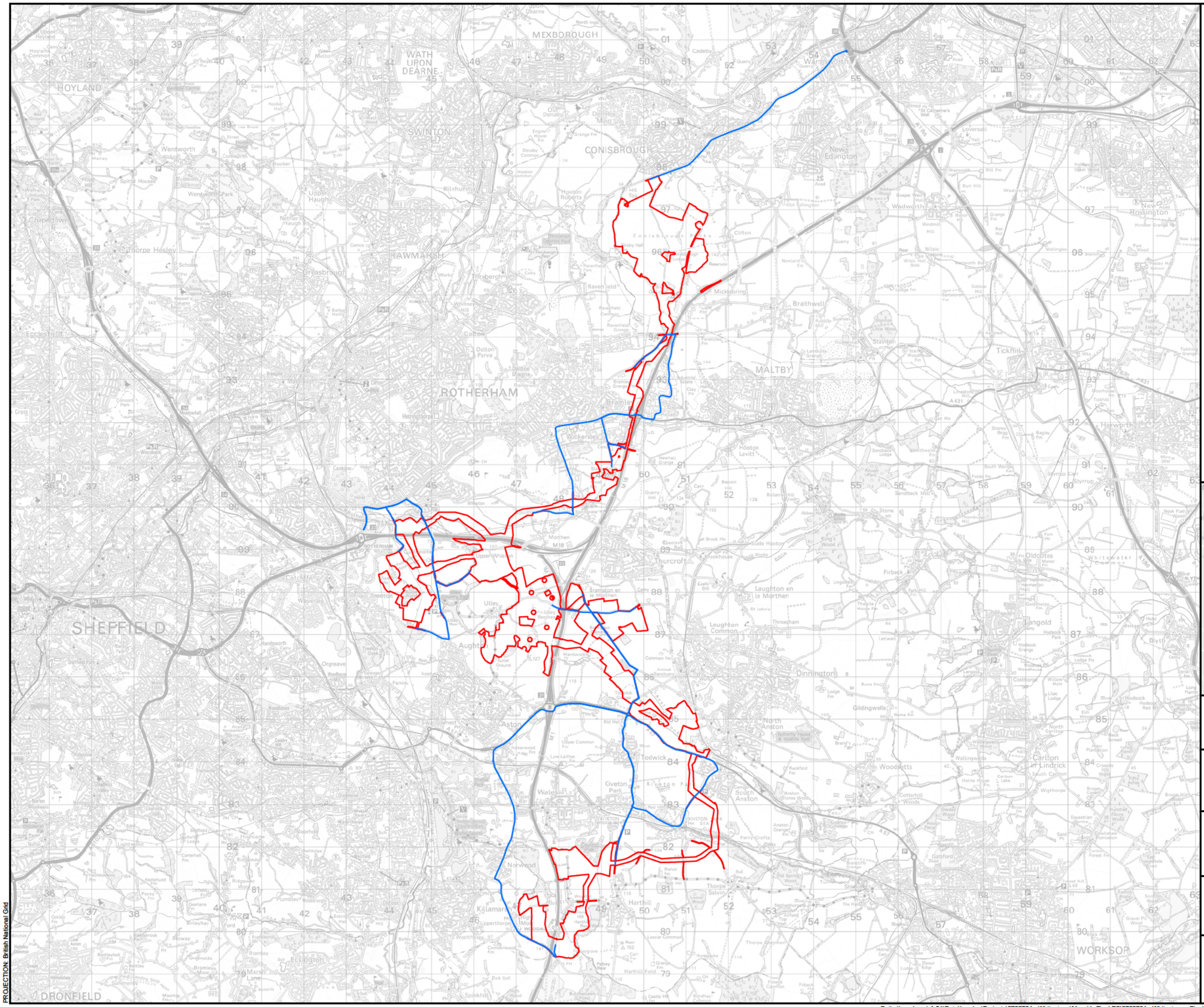

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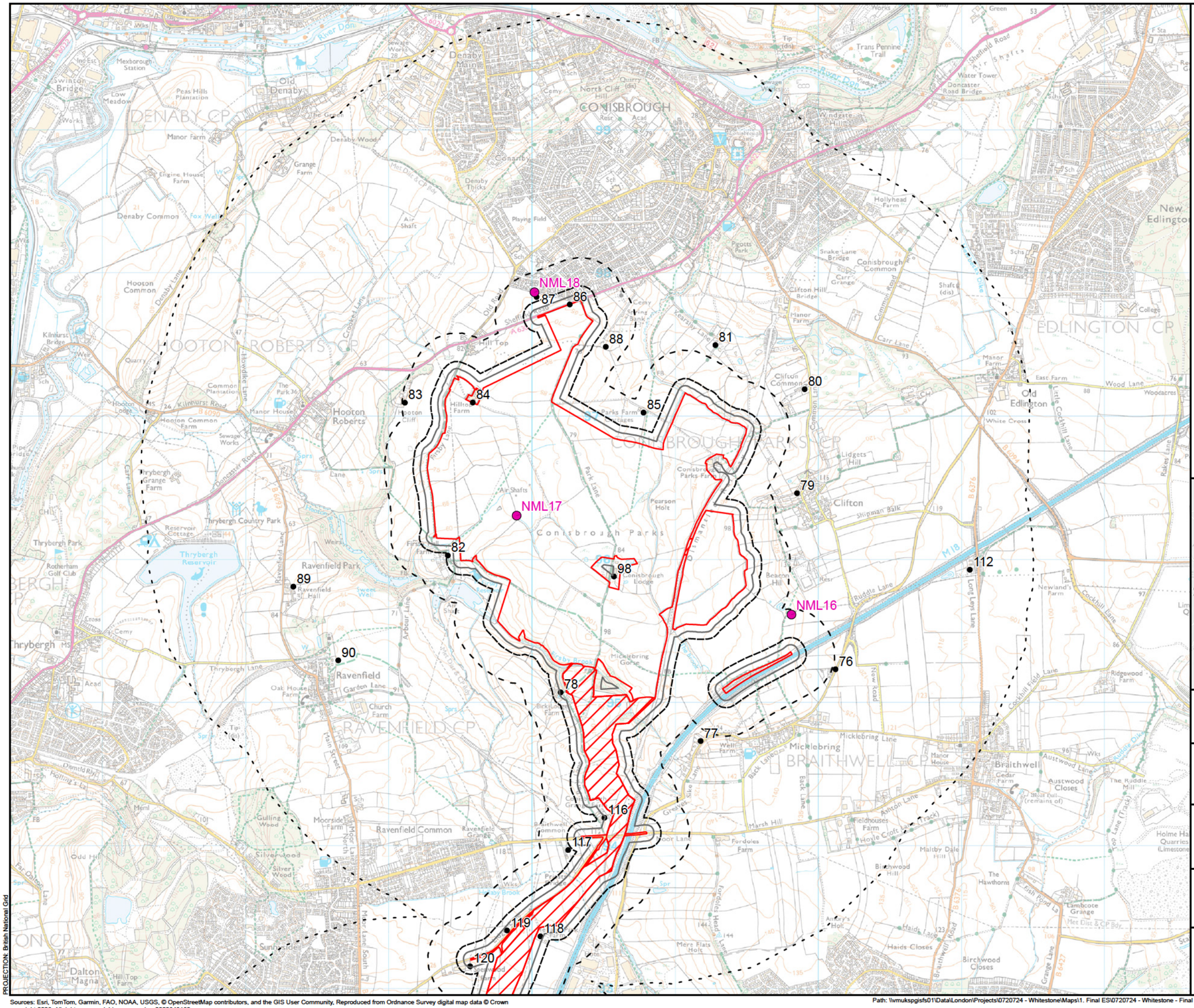

Order Limits
Cable Route
50 m Study Area
100 m Study Area (Construction Vibration)
300 m Study Area (Construction Noise)
2 km Study Area (Operational Noise)
Assessment Location
Noise Monitoring Location

SCALE: 1:25,000	VERSION: A01
SIZE: A3	DRAWN: BO
APPLICATION: EN0110020	CHECKED: RW
DATE: 27/05/2026	APPROVED: NC

Whitestone Solar Farm
Environmental Statement: Non-Technical Summary
Figure 15
Noise Monitoring Locations - W1
Sheet 1 of 1

Reference: EN0110020/APP/6.21
Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 - Regulations 5(2)(a)

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PROJECTION: British National Grid

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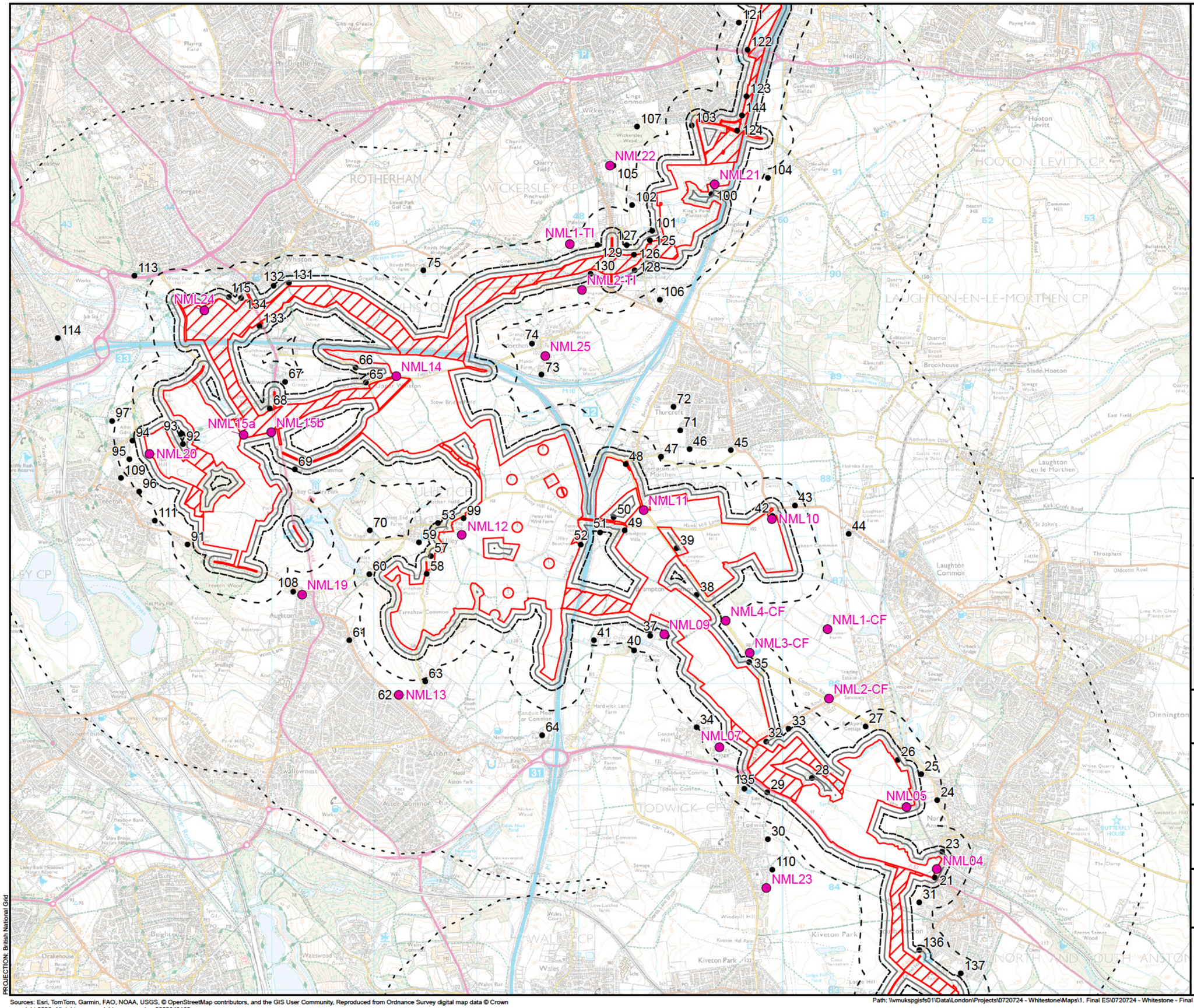

SCALE: 1:35,000	VERSION: A01
SIZE: A3	DRAWN: BO
APPLICATION: EN0110020	CHECKED: RW
DATE: 27/05/2026	APPROVED: NC

Whitestone Solar Farm
Environmental Statement: Non-Technical Summary
Figure 16
Noise Monitoring Locations - W2
Sheet 1 of 1

Reference: EN0110020/APP/6.21
Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 - Regulations 5(2)(a)

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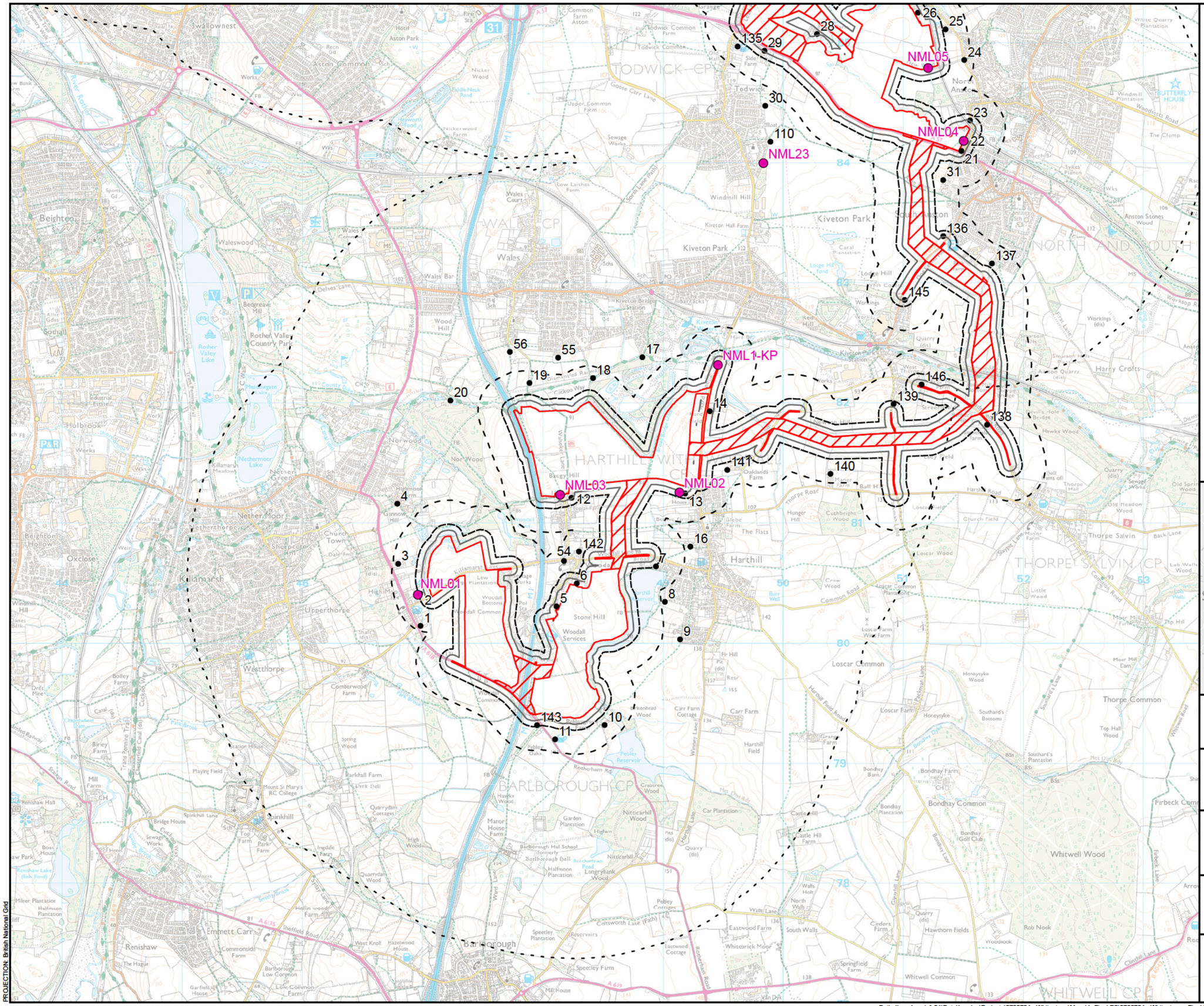

SCALE: 1:30,000	VERSION: A01
SIZE: A3	DRAWN: BO
APPLICATION: EN0110020	CHECKED: RW
DATE: 27/05/2026	APPROVED: NC

Whitestone Solar Farm
Environmental Statement: Non-Technical Summary
Figure 17
Noise Monitoring Locations - W3
Sheet 1 of 1

Reference: EN0110020/APP/6.21
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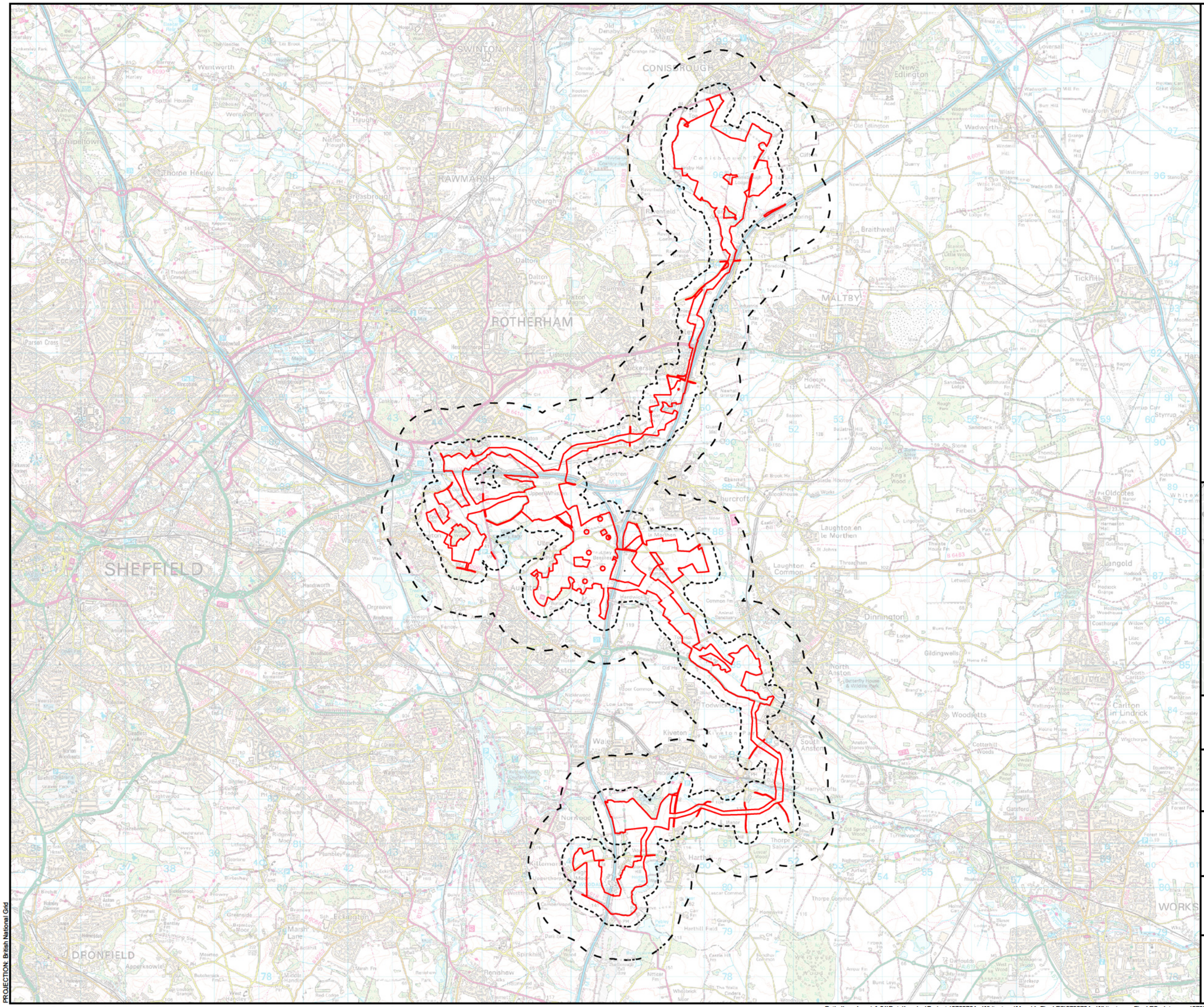
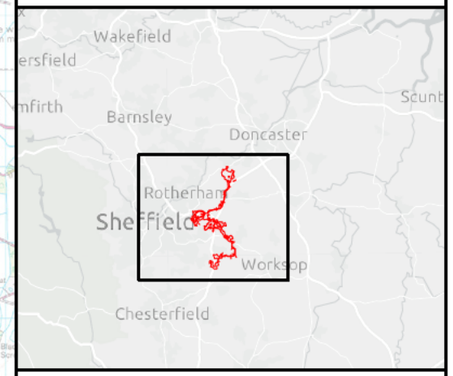


Order Limits

Zone of Influence

250 m - Air Quality and Ground Conditions

1 km - Water Resources and Glint and Glare



0 1 2 3
Kilometres

N

SCALE: 1:81,000	VERSION: A01
SIZE: A3	DRAWN: RW
APPLICATION: EN0110020	CHECKED: EB
DATE: 5/28/2026	APPROVED: AH

Whitestone Solar Farm
Environmental Statement: Non-Technical Summary
Figure 18
Cumulative Effects Assessment - Zones of Influence
Sheet 1 of 2

Reference: EN0110020/APP/6.21
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City of Doncaster Council

Rotherham Metropolitan Borough Council

Order Limits

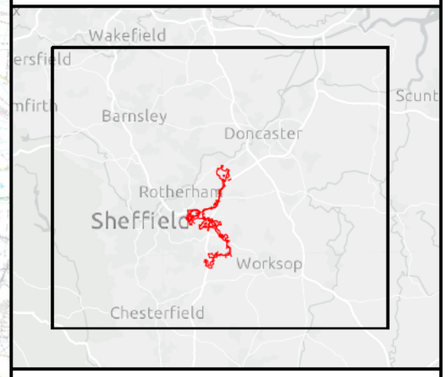
Zone of Influence

3 km - Cultural Heritage and Archaeology and Landscape and Visual

4 km - Noise and Vibration

10 km - Biodiversity

Council Boundary - Socio Economics



0 2 4 6 8
Kilometres

N

SCALE: 1:182,000	VERSION: A01
SIZE: A3	DRAWN: RW
APPLICATION: EN0110020	CHECKED: EB
DATE: 5/28/2026	APPROVED: AH

Whitestone Solar Farm
Environmental Statement: Non-Technical Summary
Figure 18
Cumulative Effects Assessment - Zones of Influence
Sheet 2 of 2

Reference: EN0110020/APP/6.21
Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 - Regulations 5(2)(a)

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