Tween Bridge Solar Farm

Environmental Statement
Chapter 2 : Scheme Description

Planning Act 2008
Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009

APFP Regulation 5(2)(a)

Document Reference: 6.1.2

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2 Introduction

2.1. Introduction

2.1.1. This chapter of the Environmental Statement (ES) provides a detailed description of Tween Bridge Solar Farm (the Scheme). This Scheme description is used to inform the environmental factor assessments which are detailed in the ES Volume 2, **ES Chapters 6 – 17 [Document Reference 6.2.6-6.2.17]**.

2.1.2. This chapter is supported by the following figures.

- **Figure 1.1 Order Limits [Document Reference 6.4.1.1]**
- **Figure 2.1 Indicative Construction Layout Plan [Document Reference 6.4.2.1]**
- **Figure 2.2a Indicative Operational Plan (Fixed Solar Panel) [Document Reference 6.4.2.2]**
- **Figure 2.2b Indicative Operational Layout Plan (Fixed and Tracker Solar Panel) [Document Reference 6.4.2.2]**
- **Figure 2.3 Height Parameters Zonal Plan [Document Reference 6.4.2.3]**
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2.2. The Order Limits

2.2.1. The extent of the Order Limits, the area within which the Scheme will be located, is shown in **ES Volume 3, Figure 1.1: Order Limits [Document Reference 6.4.1.11**].

2.2.2. The Scheme has been subject to ongoing design development and the Order Limits have been refined in response to environmental and technical factors as identified as part of the Environmental Impact Assessment (EIA) process, as well as consultation responses. This process has ensured that the Order Limits only

include land which is required to deliver the Scheme including any on-site mitigation and enhancement measures. The Scheme will be subject to detailed design post-consent within the Order Limits and the parameters of the DCO, as detailed further in section 2.5 below.

2.3. Scheme Overview

2.3.1. The main element of the Scheme is the construction, operation, maintenance and decommissioning of a ground mounted solar farm with an intended design capacity of over 50MW, and battery energy storage system (BESS). Once fully operational, the Scheme will export approximately 800MW of electricity to the National Electricity Transmission System (NETS). Flexibility in panel layout design would be required to accommodate expected future technology developments as technology continues to evolve and become more efficient.

2.3.2. Key components of the Scheme are: -

- Ground-mounted solar PV generating station and associated mounting structures,
- On-site supporting equipment including inverters, transformers and switchgear,
- A BESS including batteries and associated enclosures, monitoring systems, air conditioning, electrical cable and fire safety infrastructure. The BESS is indicatively split into four separate 100MW compounds. Each 100MW compound would be located next to and connected to one of the seven on-site 132kV Substations,
- Seven on-site 132kV Substation compounds, including transformers, switchgear, circuit breakers, control equipment buildings, control functions, material storage, parking, as well as wider monitoring and maintenance equipment,
- Low voltage and 33kV interconnecting cabling to connect and transmit electricity from the solar PV modules and BESS to one of the seven on-site 132kV Substations,
- RWE on-site 400kV Substation,
- Underground 132kV interconnecting cabling to connect the seven on-site 132kV Substations to RWE on-site 400kV Substation,

- Underground 400kV interconnecting cabling from the RWE on-site 400kV substation to edge of Order Limits
- Associated infrastructure including access tracks, parking, CCTV, gates and fencing, lighting, drainage infrastructure, storage containers, earthworks, culverts, surface water management, maintenance and welfare facilities, security cabins and any other works identified as necessary to enable the development,
- Horizontal Directional Drilling for selected cable works where trenching or culvert is not possible or appropriate, including the canal, railway and the M180,
- Highways works to facilitate access for construction vehicles, comprising passing places where necessary to ensure that heavy goods vehicles (HGVs) can be safely accommodated amongst existing traffic, new or improved site accesses and visibility splays,
- Environmental mitigation and enhancement measures, including landscaping, habitat management and biodiversity enhancement,
- Permissive pathways and bird viewing gallery, and
- Temporary development during the construction phase of the Scheme including construction compounds, parking, temporary diversions of Public Rights of Way, and temporary access roadways to facilitate access to all parts of the Order Limits.

2.3.3. Subject to obtaining the necessary consents, construction of the Scheme is anticipated to commence in 2028, and to be completed and the Scheme fully operational in 2032, with phases of capacity coming online from 2029 onward in line with the Applicant's current Grid Connection Agreement (see **Grid Connection Statement [Document Reference 5.8]**).

2.3.4. Fully operational, the Scheme would have the potential to provide enough low-carbon energy to meet the equivalent annual needs of over 388,889 average UK homes[1].

2.4. Design Principles

2.4.1. Design should be considered as a process and an outcome, and the importance of good design for Nationally Significant Infrastructure Projects (NSIPs) is championed in national policy, including Overarching National Policy Statement for Energy 2023 (NPS EN-1) (designated in January 2024) **[Ref 2-1]** and National Policy Statement for Renewable Energy 2023 (NPS EN-3) (designated in January 2024) **[Ref 2-2],** which set out criteria for achieving good design. Supporting consideration of good design for infrastructure projects, and referred to in the NPS EN-1, the National Infrastructure Commission's 'Design Principles for National Infrastructure' **[Ref 2-3]** identified the purposes of the design process is to bring together engineering, environmental and creative expertise to shape and deliver a development project. The document notes that: -

> *design is as much about process as it is product. Imaginative thinking about design should be embedded at every step of planning and delivery. The principles ensure a good process leads to a good design outcome*

2.4.1. The Scheme's design principles are set out in the **Design Approach Document (DAD) [Document Reference 5.6].** The DAD set out the vision, context and design response for the Scheme. The preparation of the DAD has been informed by the 'Nationally Significant Infrastructure Projects: Advice on Good Design **[Ref 2-4]**.

2.5. Design Parameters and the Rochdale Envelope

2.5.1. The design of the Scheme has been refined throughout the EIA process. This ES chapter provides an indicative design and construction methodology. It is recognised that parts of the Scheme design and construction methodology, as

[1] This is calculated based on the latest information published in January 2024, which contains 2022 generation data, and assuming an average (mean) annual household consumption of 3.24MWh, based on the 2022 statistics from the Department of Energy Security and Net Zero

presented, may be subject to further refinement and optimisation prior to and during construction.

2.5.2. The need for flexibility in design, layout, and technology is acknowledged in the relevant National Policy Statements (NPS EN-1, NPS EN-3 and NPS EN-5) to address uncertainties inherent to a scheme. This is very pertinent to solar and battery development due to the rapid pace of change in technology. For example, as technology advances, it is possible that solar panels could become more efficient. This in turn could require the micro-siting of panels and the associated equipment and infrastructure to reflect such changes, i.e., the final alignments of cabling and the number and location of panels, substations, inverters and transformers. Flexibility is also required for the final alignment of the 400kV export cable located within the Order Limits. The final detail is secured by requirement(s) in the **draft DCO [Document Reference 3.1]**.

2.5.3. In order to maintain flexibility in the design, the Applicant has used the 'Rochdale Envelope' approach in assessing the impacts of the Scheme within the maximum (or minimum where appropriate) parameters set out in this ES, as detailed in **ES Volume 1, Chapter 4: Approach to EIA [Document Reference 6.1.4].**

2.5.4. The design parameters for each element of the Scheme are detailed within the following sections and the **Design Approach Document Appendix A Parameters Document [Document Reference 5.6.1]**, compliance with which will be secured via a requirement in the DCO**.** These have been used to inform the assessment detailed within this ES.

Works Plans

2.5.5. The **Works Plans [Document Reference 2.3]** show the spatial limits for each work. Works can only be undertaken outside of these limits if it can be demonstrated to the Secretary of State's satisfaction, following consultation with City of Doncaster Council and North Lincolnshire Council that any deviation would not give rise to any materially new or materially different environmental effects in comparison to those reported in the ES. This is needed to provide some flexibility to the Scheme to adopt to future technical advancements.

Two Indicative Operational Layouts

2.5.6. Two design options for the ground-mounted solar PV generating station are assessed within the ES.

2.5.7. Option 1 is a mixed design with both fixed and tracker panels. In this design the majority of the Scheme will be fixed panels, with areas of tracker panels in the northern and western section of the Order Limits. Option 1 (mixed design) was assessed in the PEIR and considered in the statutory consultation process.

2.5.8. Option 2 is for the entirety of the Scheme to be a fixed panel layout. This option has been developed and assessed to ensure the Applicant has sufficient flexibility to deliver the most appropriate scheme following detailed design and having regard to ongoing technological advancements.

- Option 2 is shown on **Figure 2.2a Indicative Operational Plan (Fixed Solar Panel) [Document Reference 6.4.2.2]**
- Option 1 is shown on **Figure 2.2b Indicative Operational Layout Plan (Fixed and Tracker Solar Panel) [Document Reference 6.4.2.2]**

2.5.9. **ES Figure 2.3 Heights Parameters Zonal Plan [Document Reference 6.4.2.3]** provides the maximum height parameter within each field of the Land Parcels, and this has been used to inform the assessment within this ES.

2.5.10. The following sections provide a description of the different elements of the Scheme along with the design parameters that have been assessed within this ES. Each environmental factor/topic has assessed the design considered to be the likely worst-case scenario for that discipline to determine the potential for significant effects and identify suitable mitigation measures.

2.6. Main Elements of the Scheme

2.6.1. The main elements of the Scheme are identified below.

Ground-mounted Solar PV generating station

2.6.2. The solar panels generate electrical power by converting solar irradiance into direct current (DC) electricity. A solar panel consists of a layer of silicon cells, an anodised aluminium frame and various wiring to allow current to flow from the

silicon cells. Silicon is a non-metal with conductive properties that allow it to absorb and convert sunlight into electricity. When light interacts with a silicon cell, it causes electrons to be set into motion, which initiates a flow of electric current. Solar PV modules are proposed in Land Parcels A, B, C, D, and E, as shown in **ES Figure 1.2 Land Parcel Plan [Document Reference 6.4.1.2].**

2.6.3. The solar PV modules for either layout Option 1 (fixed and tracker panels) or Option 2 (fixed panels) will be a maximum of 3.6m in height above ground level. If Option 2 layout is pursued, the height of the tracker solar panels would vary throughout the days, up to the maximum height. The minimum height of the lowest part of the solar panels (i.e. not including the mounting structure) will be 0.8m AGL (above ground level) for both fixed array and tracking panels.

2.6.4. The solar PV modules will be positioned on the mounting structures at an angle of: +/- 10° to 30° for fixed panels and +/- 60° for tracking panels.

2.6.5. For fixed panels there will be a distance between 4m to 10m between the panels of each row. For tracking panels there will be a distance between 4m to 6m between the axis of each row.

2.6.6. For the fixed system (i.e. the relevant parts of Option 1 & Option 2 in full), the mounting structure will be supported at intervals by double mounted posts set approximately 3.75m apart. The posts will be pushed into the ground with a small plant rig, to depths of up to 3m and this will be guided by localised ground conditions. Ballast foundation design could also be used. For the tracking system (Option 1 only), the mounting structure would be supported by single posts set approximately 10m apart. Depending on ground conditions, the posts may be mounted to ballast slabs. If any areas of archaeological interest are identified within the work area, then consideration will be given to the use of non-intrusive installation method, where the posts will be fixed into concrete pads resting on top of the ground.

2.6.7. **Table 2-1** of **Design Approach Document Appendix A: Design Parameters Document [Document Reference 5.6.1]** sets out the full details of the assessed design parameters and principles for the ground-mounted solar PV generating station. Illustrative figures for the solar PV modules (fixed, tracker, piled and ballasted solutions) are provided in **ES Figure 2.6 - Indicative Layouts and Cross Section Plans [Document Reference 6.4.2.6].**

2.6.8. The insulated DC cables from the solar PV modules will be routed in channels fixed on the underside of the mounting structure. The DC string cables will run along the entire underside of each row. The 33kV electrical cabling from each array will be concealed through shallow trenches linking the solar panels to the inverters and transformers and then to the 132kV Substations. The 33kV cable trenches will have a maximum depth of 1.5m in depth and up to 1.2m wide. The cable trench may also carry earthing and communications cables and will be backfilled with fine sands and excavated materials to the original ground level. An illustrative figure for the cable trenches are provided in **ES Figure 2.6 - Indicative Layouts and Cross Section Plans [Document Reference 6.4.2.6]**.

2.6.9. The inverters, transformers, and switchgear are required to convert the DC energy produced by the solar PV modules into AC energy; these will be located across the Panel Areas. Inverter boxes could also be fixed to the mounting structure. The cabling from solar PV modules will be connected to seven on-site 132kV Substations via underground 33kV cables, from here the cabling would continue to the RWE on-site 400kV Substation via underground 132kV cables. An underground 400kV connection cable will run from the RWE on site 400kV Substation to edge of Order Limits.

2.6.10. A further 400kV export connection cable will be required to connect the Scheme to the transmission network ("the 400kV export connection cable"). The point of connection will be a new National Grid Electricity Transmission (NGET) 400kV substation ("NGET 400kV Substation"), which is to be consented and delivered separately by NGET. There is therefore currently no meaningful information for the Applicant to assess that 400kV export connection cable connection, or the NGET 400kV substation in this Environmental Impact Assessment, and this approach is further explained in **ES Chapter 17 Cumulative Impacts [Document Reference 6.3.17]** of this Environmental Impact Assessment. The 400kV export connection cable, beyond the Order Limits, therefore does not form part of the Scheme.

2.6.11. The 132kV and 400kV cabling trenches would have a maximum depth of 1.6m and a maximum width of 2m. The electrical output from the solar PV modules could also be exported to the four on-site BESS compounds. For Land Parcel A, the solar PV modules would not be erected within the gravel hardstanding area of the extant wind turbines.

2.6.12. Land between and beneath the solar PV modules will be used for biodiversity enhancements (as set out in the **Outline Landscape and Ecological Management Plan [Document 7.6]**) and potential seasonal sheep grazing. If sheep grazing is not possible then grassland will be managed through a grass cutting regime.

2.6.13. The solar PV arrays would be set within either a wire mesh or deer fencing up to 2m in height. The minimum distance between the edge of the arrays and the deer fencing would be 3m, and maximum 10m. A CCTV system mounted on 3m poles will be positioned at intervals along the inside face edge of the perimeter fencing (between the fence and the arrays). Illustrative figures for fence and CCTV detail are provided in **ES Figure 2.6 - Indicative Layouts and Cross Section Plans [Document Reference 6.4.2.6].**

Battery Energy Storage System (BESS)

2.6.14. A BESS will be associated development comprising part of the electrical infrastructure of the Scheme. A BESS is an electrochemical device that is charged by collecting energy from the grid or a power plant, such as the solar PV modules, and then discharges that energy at a later time to provide electricity or other grid services when needed. The BESS would comprise containerised battery storage systems which would be located adjacent and connect to one of the seven 132kV Substations. The BESS will be subdivided into four 100MW compounds, with two BESS compounds located within Land Parcel A and one compound located within each of Land Parcels C and E. This provides a total storage capacity of 400MW.

2.6.15. The ability to store energy is required to store surplus electricity produced and provide grid balancing services by allowing excess electricity generated from the solar PV modules to be stored and dispatched as required. The BESS may also be capable of importing electricity from the national electricity network to store electricity in order to export this electricity to the national electricity network at peak times.

2.6.16. Table 2-5 of **Design Approach Document Appendix A: Design Parameters Document [Document Reference 5.6.1]** sets out the assessed design parameters and principles for the BESS. Illustrative figures for the typical BESS layout and Battery Container dimensions are provided in **ES Figure 2.6 - Indicative Layouts and Cross Section Plans [Document Reference 6.4.2.6]**.

2.6.17. The design principles of a single BESS compound are: -

- A BESS contained within a gated compound
- The storage capacity is up to 400MW
- Total land coverage of the BESS compound is typically 96,036 m^2
- The system would be made secure by a 3m high gated palisade fence
- The BESS system would comprise battery storage containers. The specific plant arrangement of the BESS system is not yet fixed, typically, the battery containers would have a maximum length of 6.5m, maximum width of 2.5m and a maximum height of 3.6m
- Ancillary components within the compound include site office, car parking, internal access track, spares parts containers, switchgear and inverters, CCTV and four water tanks with a minimum capacity of 228m^3
- The battery storage containers would be replaced after 20 years.

2.6.18. The BESS is likely to consist of lithium-ion batteries housed in shipping container-style structures. The BESS would require associated heating, ventilation and cooling (HVAC) systems to ensure efficiency of the batteries and these systems would be integrated within the individual containers.

132kV Substations and RWE on-site 400kV Substation

2.6.19. The design provides for seven 132kV Substations, split across Land Parcels A, B, C, D and E, and one RWE on-site 400kV Substation positioned within Land Parcel E.

2.6.20. Each 132kV Substation will have a development footprint of up to 60m by 110m. These are necessary to step up the voltage of the electricity delivered by the solar PV modules from 33kV to 132kV for onward transmission to the RWE on-site 400kV Substation where the 132kV is converted to 400kV for connection to the National Grid circuit.

2.6.21. Electric cabling will be laid to link together the seven 132kV Substations to the RWE on-site 400kV Substation.

2.6.22. The RWE on-site 400kV Substation would have a maximum development footprint of 156m by 220m.

2.6.23. Piled foundations are the most likely option for the 132kV Substations and RWE on-site 400kV Substation. A defensive bund may also be sited around the vulnerable infrastructure on site, alternatively their finished floor levels can be raised above the flood risk levels, within the parameters of the DCO (as set out in **Design Approach Document Appendix A: Design Parameters Document [Document Reference 5.6.1]**).

2.6.24. The majority of the cabling linking the 132kV Substations and RWE on-site 400kV Substation would be laid by open trench technique. The dimensions and depth of the trenches would vary depending on the amount of cabling and ground conditions, typically they would be up to 1.6m in depth. The process will follow a soil management plan to ensure that the soil structure and quality are not degraded as part of the construction process, an Outline of which is provided as part of the DCO application **[Document Reference 7.8].**

2.6.25. The likely plant arrangements for the seven 132kV on-site Substations include: -

- Gated compound with security fencing – 2.4m high palisade fencing enclosed by a 1.2m high stock fence
- Car Parking
- Pre-fabricated building containing switch room, office and welfare facilities, up to a maximum of 4m in height
- Transformer Bay
- 132kV switchgear
- Combined standby lighting and CCTV columns
- Communication lattice tower measuring up to 15m in height and/or fibre optic communications cable

2.6.26. The likely plant arrangement for the RWE on-site 400kV Substation includes: -

- Gated compound with security fencing – 2.4m high palisade fencing with an electric fence backing of 3m high from ground level
- Car parking

- Control building with a maximum height of 6.3m
- Standby diesel tank and generator
- Six lightning conductors with a maximum height of 15m
- 400kV Filter compound
- 3 No. 320MVA 400kV/132kV (with tertiary) Transformer compounds
- 12 No. 132kV AIS switchgear bays.
- Six 400kV switchgear bays.
- 2 No. Reactive Power Compensation compounds

2.6.27. Table 2-4 of **Design Approach Document Appendix A: Design Parameters Document [Document Reference 5.6.1]** sets out the assessed design parameters and principles for the 132kV on-site Substations and the 400kV on-site Substation. Illustrative figures for the typical 132kV Substations and RWE on-site 400kV Substation are provided in **ES Figure 2.6 - Indicative Layouts and Cross Section Plans [Document Reference 6.4.2.6]**.

Culvert Crossings

2.6.28. Where access tracks are required to cross a watercourse, the approach will be to construct a reinforced culvert structure, to allow for the watercourse to continue unimpeded whilst construction activities take place. Cables would also be laid across the culverts. A number of the proposed access tracks within the Land Parcels will utilise existing culvert crossings and/or bridge structures. For the purposes of the assessment, 125 locations are assumed to require either the creation of a new culvert or the reinforcement/widening of an existing culvert/bridge structure, as shown on **ES Figure 2.5 Indicative Culvert Crossing Plan [Document Reference 6.4.2.5].** To ensure a worst case scenario has been assessed, it has been assumed that all existing crossings will require culverting with an extension to each existing structure. An Illustrative figure for the typical culvert crossing is provided in **ES Figure 2.6 - Indicative Layouts and Cross Section Plans [Document Reference 6.4.2.6]**.

Trenchless Cable Works

2.6.29. Within the Order Limits, there are a number of locations that may require a trenchless approach to the laying of cables, where open trenching is not possible (see **ES Figure 2.4 Indicative HDD Crossing Plan [Document Reference 6.4.2.4]**). At these locations trenchless techniques, such as boring, micro-tunnelling, or moling methods are likely to be undertaken. The Applicant has commissioned technical assessments and ground investigations works to inform final design detail. For each location where a trenchless technique may be required a launch pits will have to be created to ensure the equipment can be used safely and the cable installed correctly. The maximum extent of these launch pits is expected to be around 30m x 30m.

2.6.30. The potential locations where trenchless techniques may be utilised are listed below.

- M180 motorway crossing
- Stainforth and Keadby Canal
- South Humberside Main Line Railway
- High Level Bank Road (A18)
- Under selected watercourse

2.6.31. Illustrative figures for the typical non-intrusive cable crossing options are provided in **ES Figure 2.6 - Indicative Layouts and Cross Section Plans [Document Reference 6.4.2.6**].

Ecological and Landscape Mitigation and Enhancement Corridors

2.6.32. The Scheme presents considerable opportunities for landscape and biodiversity mitigation and enhancements.

2.6.33. Extensive habitat enhancement provision is embedded within the Scheme and provided as part of the construction phase which include the creation of new habitats of high ecological value and Biodiversity Net Gain (BNG). A number of measures and features are proposed for the benefit of biodiversity. This includes

the planting of new hedgerows and bolstering of existing field boundaries to increase coverage of this habitat, provide effective landscape screening, and to improve connectivity of the hedgerow and woodland network across and beyond the Order Limits. The management strategy of these semi-natural habitats and the BNG is informed by the **Outline Landscape Ecological Management Plan (LEMP) [Document Reference 7.6].** The final strategy will be confirmed via the LEMP which will be secured via a requirement in the DCO. The Outline LEMP sets the following objectives for nature conservation management: -

- Objective 1: To provide open areas of permanent pasture specifically managed for the benefit of ground-nesting bird species and non-breeding bird species over winter and on passage;
- Objective 2: To provide permanent areas or arable land managed for the benefit of ground-nesting bird species such as nesting and foraging skylark, and non-breeding bird species over winter and on passage, specifically pink-footed geese;
- Objective 3: To provide strengthened green corridors along field boundary features, specifically for the benefit of nightjar;
- Objective 4: To enhance quality of existing woodland habitat;
- Objective 5: To enhance quality of ditch network;
- Objective 6: To monitor the efficiency of nature conservation management through regular assessment of habitat establishment; and
- Objective 7: To enhance the value of the land within the Order Limits for roosting bats and nesting birds through the installation and continued care of bat and bird boxes on retained trees.

2.7. Recreation and amenity improvements

2.7.1. The Scheme will include recreation and amenity improvements designed to retain and enhance recreational connectivity within the Order Limits. Following the completion of the solar PV modules within Land Parcel A, a new permissive path, would be created. The permissive path provides a continuation from Thorne-19 Public Right of Way, creating a circular loop, within Land Parcel M1(A), overlooking the Thorne Moors. A bird viewing platform or bird hide would be provided along

the circular loop within Land Parcel M1(A), allowing for wildlife watching within the site and over towards the Thorne Moors.

2.7.2. The **Landscape and Visual Mitigation Strategy (ES Figure 6.4) [Document Reference 6.4.6.4]** illustrates the proposed arrangement for the permissive path.

2.8. Construction, Phasing of Development

2.8.1. The Environmental Statement assumes that construction of the Scheme is built out over up to, a 54 month-period (2028- 2032) in either a single phased approach (development of Land Parcels completed one after another with the potential for breaks between development of Land Parcels) or through multiple phases (development of Land Parcels concurrently). For the multiple phase construction option, no more than two land parcels (within land parcels A-E) would be built out at the same time. ES Environmental Aspect Chapters determine in the methodology 'Assessment Approach' section which of the two options for the construction phasing approach would give rise to the 'worst-case scenario' for the purpose of their assessment. The current connection date for the Scheme, within the NESO Connection Agreement is 2029. As with all electricity generation projects, this date is under review by NESO as part of the ongoing connections reform process.

2.8.2. If the NESO Connection Agreement remains with the connection date of 2029, it would be possible to operate a phased start to operational generation. This phased approach would connect each Land Parcel to the RWE on-site 400kV substation when construction of that Land Parcel was completed. In this operational scenario there would be partial Scheme operation from 2029-2032 (3 years). From 2032 onwards the full Scheme would be generating at full operational capacity. The full Scheme would operate for 40 years until 2072. If the NESO Grid Connection date varies, which is not within the Applicants direct control, the timeframe where there could be partial operation of the Scheme could reduce or fail to materialise. In this situation the full operational Scheme would operate for 40 years from its new grid connection date. In either connection scenario there will be full operational generation for 40 years, which would be the worst-case scenario operational time period for the Scheme.

2.8.3. The final construction programme will depend on the detailed layout, design and potential environmental constraints on the timing of construction activities. An

indicative overview of the final construction programme will be set out in the Construction Environmental Management Plan(s) for information."

2.8.4. A main temporary construction compound will likely be established close to the Site entrance for each Panel Area. Smaller temporary compounds will be located across the Site as the scheme is built out. Depending on weather conditions during construction, temporary roadways (e.g., plastic matting) may be utilised to access parts of the Scheme. **ES Figure 2.1 - Indicative Construction Layout Plan [Document Reference 6.4.2.1]** details the proposed locations of the construction compounds.

Construction Working Hours

2.8.5. The core working hours on any part of the Scheme during the construction period will be:

- 07:00 hours to 19:00 hours Mondays to Saturdays; and
- 09:00 hours to 13:00 hours on Sundays.

2.8.6. The following controls will also apply to the works:

- Working days will be one 12-hour shift, with employees travelling to and from the Order Limits an hour on either side of these times (i.e. between 06:00 and 07:00, and 19:00 and 20:00) (exceptions may be required for abnormal loads and emergency purposes); and
- Where onsite works are to be conducted outside the core working hours, they will comply with the restrictions pursuant to the consenting process.

2.8.7. In some circumstances, such as when drilling for the cable works has begun and cannot be stopped until it is complete, operational hours may be required to be extended beyond 19:00. However, it is considered that this will be an infrequent occurrence as works will be planned to avoid nighttime hours and works will typically be complete by 19:00.

2.8.8. The construction working hours will be secured via the CEMP, to be in accordance with the **Outline CEMP [Document Reference 7.1]** and approved by the relevant local planning authority under a DCO requirement.

Access and Egress

2.8.9. There are currently a total of 28 access points proposed. The majority of the access points relate to existing agricultural accesses that will require upgrading. 6 new access points will be required. Details of the accesses are provided in the **Outline Construction Traffic Management Plan (Outline CTMP) [Document Reference 7.8]** and **ES Chapter 12: Transport and Access [Document Reference 6.2.12].**

2.9. Statutory Undertakers

2.9.1. The provision of easements for the existing services that traverse the Site, such as water pipes and overhead powerlines, have been incorporated into the layout design. The **draft DCO [Document Reference 3.1]** sets protective provisions to cover the interests of affected statutory undertakers.

2.10. Temporary Diversion of Public Right of Way ('PRoW')

2.10.1. Temporary diversion of sections of PRoWs Thorne 19 and CROW 21, which traverse the Site, may be required during the construction and decommissioning periods in order to separate and keep apart members of the public from the construction / decommissioning vehicles and machinery. If a temporary closure of the PRoW is required, an alternative path would be provided. This would be secured through the provision of a Final Construction Environmental Management Plan under a requirement of the **draft DCO [Document Reference 3.1]**. The temporary diversion will cease following the relevant construction and/or decommissioning works. Alternatively, where construction vehicles crossing the PRoW cannot be prevented, a banksman could be used to ensure the continued safe passage of the public on the PRoW.

2.11. Operational Phase

2.11.1. During the operational phase, the activities within the Order Limits would amount to servicing and maintenance of plant and equipment associated with the Scheme, including delivery of spare parts and replacement equipment items, repair or replacement of solar PV modules, inverters, transformers, substation compound, vegetation and biodiversity management. The BESS would be replaced after 20 years. Land between and beneath the panels would be used for biodiversity enhancements and agricultural use could continue through sheep grazing.

2.11.2. Along the routes of cables required as part of the Scheme, operational activity will consist of routine inspections and any reactive maintenance such as where a cable has been damaged.

Operational staff and working hours

2.11.3. It is anticipated that there will be a small number of permanent staff employed during the operational phase. Additional staffing/visitors such as maintenance workers and deliveries will be as needed. Details on the anticipated number of operational workers and working hours can be found in the **Outline Operational Environmental Management Plan (Outline OEMP) [Document Reference 7.2].**

Operational Site Access

2.11.4. Access to the Order Limits from the local highway network would be required during the operational phase to allow for ongoing maintenance activities. The operational phase is not anticipated to generate a significant number of trips. More detail on this is provided within **ES Appendix 12.1: Transport Statement [Document Reference 6.3.12.1]**.

2.11.5. Access to the Scheme during operation is anticipated to be via the same routes and access points used for construction.

Battery Safety

2.11.6. An **Outline Battery Safety Management Plan (Outline BSMP) [Document Reference 7.4]** sets out the approach to be taken to manage the safety of the BESS in accordance with regulatory requirements, guidance, and good industry practice. The Outline BSMP addresses aspects such as safety, design, operation, and the strategy for firefighting and emergency planning.

Landscape and Ecological Management

2.11.7. A programme of environmental enhancements will be established during the construction phase of the Scheme. The **Outline LEMP [Document Reference 7.6]** sets out the principles for how the environmental enhancements will be managed throughout the operational (including maintenance) phase, following the completion of construction. In terms of requirements, prior to the commencement of the Scheme, a Final LEMP would be submitted to and approved by the local planning authorities.

2.12. Decommissioning Phase

2.12.1. Following 40- years of a fully operational Scheme, it is proposed that the Scheme will be decommissioned. This decommissioning with take approximately 24 months and will be in a phased approach.

2.12.2. The process of decommissioning would involve the removal of all solar infrastructure, including the solar PV modules and on-site supporting equipment, to be recycled or disposed of in accordance with industry best practices at that time. It is anticipated at this stage that underground cabling would be left in-situ to avoid unnecessary ground disturbance. Any proposals to leave certain infrastructure, for example access tracks, would be discussed and agreed with landowners as part of the decommissioning process. Temporary diversion of the PRoW traversing the Order Limits may also take place during decommissioning.

2.12.3. The effects of decommissioning are often similar to, or to a lesser magnitude than, the construction effects. However, there can be a high degree of uncertainty regarding decommissioning as engineering approaches and technologies evolve over the operational life of the Scheme. Furthermore, at the time that decommissioning would take place, the regulatory framework, good industry practices and the future baseline could have altered.

2.12.4. Following the decommissioning of the Scheme, the Order Limits would be restored to their pre-construction condition (notwithstanding that some elements of the Scheme may be retained, as outlined in paragraph 2.12.2 above). After completion of the restoration works, an aftercare period may be required. This would be to check the condition of the soil and grass (or other crop); and amelioration work would be undertaken as necessary, e.g., infilling of settlement hollows, subsoiling to improve soil structure and to correct any patchy areas of poor growth.

2.12.5. A Decommissioning Environmental Management Plan would be secured pursuant to the DCO as a requirement; to be prepared in advance of the commencement of decommissioning works of each Land Parcel and this would be in substantial accordance with the **Outline Decommissioning Environmental Management Plan (Outline DEMP) [Document Reference 7.3]**. Not less than 6 months before the planned end to energy generation, a Decommissioning Environmental Management Plan would be submitted to and subject to the approval of the relevant local planning authority. The decommissioning period is expected to take approximately 2 years.

2.13. DCO Requirements

2.13.1. The application includes various outline management plans and documents that are intended to be detailed and finalised post-consent and these would be secured through the discharge of various proposed requirements. The suggested requirements are laid out in the **draft DCO [Document Reference 3.1],** these cover:

- Time limit for commencement of authorised development
- Phasing of the authorised development and date of final commissioning
- Requirements for written approval
- Amendments to approved details
- Detailed design approval
- BESS fire safety management
- Landscape and ecological management plan
- Fencing and other means of enclosures
- Soil management
- Surface and foul water drainage
- Archaeology
- Construction environmental management plan
- Operational environmental management plan
- Construction traffic management plan
- Operational noise
- Skills, supply chain and employment
- Decommissioning and restoration
- Public Rights of Way condition surveys
- Consultation prior to submission of detail

2.14. References

- Ref. 2-1: Department for Energy Security and Net Zero (2023) Overarching National Policy Statement for Energy (EN-1)
- Ref. 2-2: Department for Energy Security and Net Zero (2023) National Policy Statement for Renewable Energy Infrastructure (EN-3)
- Ref 2-3: National Infrastructure Commission Design Group (2020) Design Principles for National Infrastructure
- Ref 2-4: Planning Inspectorate [2025] Guidance- Nationally Significant Infrastructure Projects: Advice on Good Design