HELIOS RENEWABLE ENERGY PROJECT

PINS Document Number:
EN010140/APP/6.1.3

Pursuant to:
APFP Regulation 5(2)(a)

Environmental Statement Chapter 3: Site and Development Description

June 2024

3. Site and Development Description

3.1.1. This chapter provides an overview of the Site and surrounding area, and describes the Proposed Development as assessed within this ES.

3.1.2. This chapter is supported by the following figures:

- **Figure 3.1 Field Boundaries Plan [EN010140/APP/6.2.3.1];**
- **Figure 3.2 Parameter Plan [EN010140/APP/6.2.3.2];**
- **Figure 3.3 Indicative Design [EN010140/APP/6.2.3.3];**
- **Figure 3.4 Solar PV Panel Elevations [EN010140/APP/6.2.3.4];**
- **Figure 3.5 Field Stations [EN010140/APP/6.2.3.5];**
- **Figure 3.6 132 kilovolt ('kV') Substation [EN010140/APP/6.3.3.6];**
- **Figure 3.7 Battery Energy Storage System ('BESS') Battery Container Elevations [EN010140/APP/6.2.3.7];**
- **Figure 3.8 BESS Control Room Elevations [EN010140/APP/6.2.3.8];**
- **Figure 3.9 BESS Inverter/ Transformer [EN010140/APP/6.2.3.9];**
- **Figure 3.10 BESS Switchroom [EN010140/APP/6.2.3.10];**
- **Figure 3.11 Fence and Gate Elevations [EN010140/APP/6.2.3.11];**
- **Figure 3.12 BESS Battery Fence and Gate [EN010140/APP/6.2.3.12];**
- **Figure 3.13 Closed Circuit Television ('CCTV') Elevations [EN010140/APP/6.2.3.13];**
- **Figure 3.14 Construction Vehicle Route [EN010140/APP/6.2.3.14];**
- **Figure 3.15 Internal Access Road Detail [EN010140/APP/6.2.3.15];**
- **Figure 3.16 Landscape Strategy Plan [EN010140/APP/6.2.3.16];**
- **Figure 3.17 Elevations with Archaeological Mitigation [EN010140/APP/6.2.3.17 REF];**
- **Figure 3.18 Access Road with Archaeological Mitigation [EN010140/APP/6.2.3.18];** and

- **Figure 3.19 Weather Station [EN010140/APP/6.2.3.19]**

3.1.3. This chapter is supported by the following appendix:

- **Appendix 3.1 BESS Safety Management Plan [EN010140/APP/6.3.3.1].**

3.2. Site Context and Description

3.2.1. The Site (refer to **Figure 1.1 Site Location Plan [EN010140/APP/6.2.1.1]**) encompasses 475ha of agricultural land located in North Yorkshire.

3.2.2. Selby is the principal settlement closest to the Site, approximately 1.5km to the north at the closest distance. Several smaller settlements are dispersed throughout the area, including Camblesforth (immediately north of the Underground Cable Corridor[1] in the north-eastern part of the Site shown on **Figure 3.2 Parameter Plan [EN010140/APP/6.2.3.2]**), Hirst Courtney (approximately 400m to the south), Temple Hirst (approximately 600m to the south west), Carlton (approximately 900m to the south), Drax (approximately 500m to the east of the Underground Cable Corridor in the north-eastern part of the Site), Barlow (approximately 1.4km to the north east) and Burn (approximately 1.7km to the west). The industrial complexes of Drax (immediately north of the Underground Cable Corridor in the north-eastern part of the Site), and Eggborough Power Stations (approximately 3.3km to the south west) form prominent features in the surrounding landscape. A former airfield (RAF Burn) is located approximately 300m to the west of the Site at Burn, which is currently used by the Burn Gliding Club.

3.2.3. The Site contains 47 fields, as shown on **Figure 3.1 Field Boundaries Plan [EN010140/APP/6.2.3.1]**. The Solar Farm Zone (as shown on **Figure 3.2 Parameter Plan [EN010140/APP/6.2.3.2]**) is bound to the north-east by the A1041, to the west by agricultural fields between the Site and the Selby Branch of the East Coast Mainline railway further west, and to the south by agricultural fields, and agricultural and horticultural development surrounding Moss Green Lane. The surrounding landscape is characterised by large, irregular-shaped fields delineated by partially denuded hedgerows and drainage ditches. Occasional woodland blocks and tree belts are also present, but the landscape is primarily flat and open.

[1] The area within the Order limits proposed for the 132 kV grid connection cables between the Solar Farm Zone and the Drax National Grid Substation on the eastern boundary of the Drax Power Station.

3.2.4. Transport routes are a notable feature in the vicinity of the Site, with the M62 and A63 extending on east – west alignments beyond the southern and northern extents of the Site, respectively. Public Rights of Way ('PRoW') cross the Site and the wider landscape, often following farm tracks or rural lanes. The Trans-Pennine Trail long-distance walking and cycling route extends south from Selby and runs in proximity to the western and southern parts of the Site boundary, adjacent to the western boundary at the closest point.

3.3. Use of the Rochdale Envelope

3.3.1. As set out in paragraph 4.3.11 and 4.3.12 of NPS EN-1:

'*in some instances it may not be possible at the time of the application for development consent for all aspects of the proposal to have been settled in precise detail. Where this is the case, the applicant should explain in its application which elements of the proposal have yet to be finalised, and the reasons why this is the case*.

Where some details are still to be finalised, the ES should, to the best of the applicant's knowledge, assess the likely worst-case environmental, social and economic effects of the proposed development to ensure that the impacts of the project as it may be constructed have been properly assessed.'

3.3.2. Paragraph 2.10.70 of NPS EN-3 states that '*not all aspects of the proposal may have been settled in precise detail at the point of application. such aspects may include:*

- *The type, number and dimensions of the panels;*
- *Layout and spacing;*
- *The type of inverter or transformer; and*
- *Whether storage will be installed (with the option to install further panels as a substitute).'*

3.3.3. The design of the Proposed Development cannot be finalised until the tendering process for the design has been completed and the detailed design has been approved in advance of the Proposed Development commencing (or first phase thereof). This is to allow for flexibility to accommodate changes in technological advancements. For example, the enclosure or building sizes may vary depending on

the contractor selected and their specific configuration and selection of plant.

3.3.4. In order to maintain flexibility in the design and layout at this stage in the process, the assessment of the Proposed Development, in accordance with NPS EN-1, has adopted the Rochdale Envelope approach, as described in the *PINS Advice Note Nine: Rochdale Envelope* (July 2018). This involves specifying parameter ranges, including details of the maximum, and where relevant the minimum, size (footprint, width, and height relative to above ordnance datum ('AOD')), technology, and locations of the different elements of the Proposed Development.

3.3.5. The use of the Rochdale Envelope approach has therefore been adopted to present a reasonable worst-case assessment of the potential environmental effects of the Proposed Development. The list of parameters for each of the components described below is presented in Table 3.2.

3.3.6. To assist with the interpretation of the Rochdale Envelope, Figure 3.2 Parameter Plan has been created for the operational phase to provide a visual representation of the areas for development within the Order limits in accordance with the parameters set out within this chapter.

3.3.7. It is the establishment of the maximum parameters which enables a robust assessment of likely significant effects to be undertaken within this ES, for topics where the nature of the assessment requires a specific level of details, such as maximum heights, massing or noise levels, and thus form the basis of assessment.

3.3.8. Each environmental topic has assessed the maximum parameters within the Rochdale Envelope to determine the potential for significant effects and to identify suitable mitigation measures.

3.4. Proposed Development

Overview

3.4.1. Infrastructure will be located to avoid significant impact on any specific designations or assets and, where appropriate, in response to feedback from consultees. **Chapter 4 Alternatives and Design Evolution [EN010140/APP/6.1.4]** section 4.6, discusses how the Proposed Development has evolved in response to consultee feedback. The technologies proposed (solar photovoltaic (PV) and battery energy storage) are

rapidly evolving, therefore will be secured at the detailed design stage.

3.4.2. As shown on **Figure 3.2 Parameter Plan [EN010140/APP/6.2.3.2]**, the Site comprises the Solar Farm Zone, Underground Cable Corridor, and Substation and BESS compound.

3.4.3. The principal components of the Solar Farm Zone comprise the following (shown on **Figure 3.2 Parameter Plan [EN010140/APP/6.2.3.2]**):

- Solar PV modules;
- Mounting structures;
- Field Stations;
- Distribution cables;
- Grid connection cables;
- Ancillary infrastructure such as fencing, security systems, and CCTV;
- Access tracks;
- Access gates;
- Green Infrastructure; and
- Archaeological mitigation.

3.4.4. The Substation and BESS Compound comprises (please note not all the items listed below are shown on the **Figure 3.2 Parameter Plan [EN010140/APP/6.2.3.2]):**

- 132kV substation;
- BESS and associated infrastructure;
- Access tracks;
- Access gates;
- Fencing;
- Earth flood defence bund;
- Attenuation ponds;
- Cabling;
- CCTV; and

- Water tanks.

3.4.5. The Underground Cable Corridor comprises two areas, one within the centre of the Site, and the other area extends from the eastern boundary of the Site to the Point of Connection[2] ('PoC') at Drax National Grid Substation on the eastern boundary of the Drax Power Station. The ES will identify the likely significant environmental effects of the entire Proposed Development, including the Underground Cable Corridor and PoC.

3.4.6. The indicative design is provided at **Figure 3.3 Indicative Design [EN010140/APP/6.2.3.3].**

3.4.7. The Proposed Development will have an export capacity of over 50MW.

3.4.8. The Proposed Development will use cables and infrastructure with a maximum voltage up to and including 132kV, in line with the guidance thresholds referenced in DECC Power Lines: Demonstrating compliance with EMF public exposure guidelines, A Voluntary Code of Practice 2012 guidance[3].

Proposed Development Components

3.4.9. The components of the Proposed Development are described in detail below and in summary in Table 3.2

Solar PV Modules

3.4.10. The Proposed Development will include solar PV modules, formed by a series of monofacial or bifacial, mono-crystalline 'solar cells'. Solar PV modules convert sunlight into electrical current (as direct current ('DC')). The DC generating capacity of each solar PV module will depend on advances in technological capabilities at the time of construction, and therefore will be confirmed at detailed design stage of the Proposed Development.

3.4.11. The solar PV modules will be placed on mounting structures, arranged in rows known as 'solar PV panels', which will be made of silicon glass and include an anti-reflective coating. Multiple solar PV panels will be connected to one another to form 'solar PV

[2] The location at which the Proposed Development's electricity export cables will connect into the National Grid transmission network at the Drax National Grid Substation.

[3] Availblae at: https://assets.publishing.service.gov.uk/media/5a796799ed915d07d35b5397/1256-code-practice-emf-public-exp-guidelines.pdf Accessed: May 2024

strings', and solar PV strings will be grouped in parallel to form 'solar PV arrays'.

3.4.12. The DCO application will seek flexibility for different configurations of solar PV modules. The final elevations of the solar PV modules will be influenced by various design factors such as local topography, selection of solar PV module type and configuration; the maximum parameters assessed for the elevation are discussed in paragraphs 3.4.12 and 3.4.14. The gap between the rows of solar PV panels will vary responding to local topography, but will have a minimum separation distance of 2m, to minimise effects of shadowing and to ensure optimal efficiency.

Mounting Structures

3.4.13. The panels will utilise a Single Access Tracker ('SAT') system, oriented north-south and will tilt east-west. The panel framework (refer to **Figure 3.4 Solar PV Panel Elevations [EN010140/APP/6.2.3.4]**) at its highest point (when tilted at 60°) will be up to 3m above existing ground levels and at the lowest point up to 900mm above existing ground levels to allow for movement of grazing sheep underneath[4].

3.4.14. The solar PV modules will be ground mounted to a piled metal frame of anodised aluminium alloy or galvanized steel with rough matte finish. The framework posts will be pile driven, up to 2.5m below ground level, depending on ground conditions.

Inverters

3.4.15. As a 'worst-case scenario', central inverters[5] have been assumed instead of string inverters[6] for the Proposed Development. Should string inverters be progressed, the central inverters would not be required.

Field Stations

3.4.16. In order for the energy produced by the solar PV modules to be delivered to the Substation, supporting infrastructure is provided in the form of central containerised field stations which house a central inverter, transformer and switchgear, or these elements may stand alone within the Solar Farm Zone.

- Inverters are required to convert the DC electricity collected by the solar PV

[4] In lieu of arable agricultural operations on the Site for the operational phase of the Proposed Development, the areas under solar panels will remain available for grazing by the farm holdings that operate within the boundaries of the Site.
[5] Central inverters are installed in a central location to the solar PV panels, and are connected to multiple solar PV panels.
[6] Strong inverters are connected directly to each solar PV panel.

modules into alternating current ('AC') which allows the electricity generated to be exported to the National Grid;

- Transformers are required to step up the voltage of the electricity generated by the PV modules before it reaches the Substation; and
- Switchgear is the combination of electrical disconnect switches, fuses or circuit breakers used to control, protect, and isolate electrical equipment. Switchgears are used both to de-energise equipment to allow work to be done and to clear faults downstream.

3.4.17. The field stations comprise up to 100 stations, with each unit measuring up to 12.2m in length x 2.4m in width x 3.5 in height, including concrete supports from a minimum of 300mm to a maximum of 600mm in height, above a 300mm permeable deep gravel sub-base within a defined BESS area (refer to **Figure 3.5 Field Stations [EN010140/APP/6.2.3.5]**). The container or cabinet will be externally finished to be in keeping with the prevailing surrounding environment, with solar farms often utilising a green painted finish.

String Inverters

3.4.18. String inverters would be mounted to the mounting structures underneath the solar PV infrastructure, and a string inverter will be required for every solar PV string.

3.4.19. Where string inverters are used, string transformers are required and would be distributed throughout the Solar Farm Zone within containers. Switchgears would be housed in these same containers or integrated with other components within the Solar Farm Zone.

Substation and BESS Compound

3.4.20. The on-Site 132 kV Substation and the BESS will be housed together in a compound.

3.4.21. The Substation will comprise an earthing transformer, surge arresters, earth switch, circuit breaker, 33kV intake switch room and generator transformers. The component of the greatest height within the Substation is the generator transformer, standing up to 6.5m (as shown in **Figure 3.6 132 kV Substation [EN010140/APP/6.2.3.2]**).

3.4.22. The BESS will include the following:

- Battery containers of up to 12.2m in length x 2.4m in width x 3.5m in height, including concrete supports 600mm in height (refer to **Figure 3.7 BESS Battery Container Elevations [EN010140/APP/6.2.3.7]**);
- Control room (including a weather station, Wi-Fi antenna and satellite aerial) of up to 6m in length x 3m in width x 5.7m in height (**Figure 3.8 refer to BESS Control Room Elevations [EN010140/APP/6.2.3.8]**);
- Inverter-transformers of up to 6.1m in length x 2.4m in width x 3.5m in height, including supports 600mm in height (refer to **Figure 3.9 BESS Inverter/ Transformer [EN010140/APP/6.2.3.9]**); and
- Switch room of up to 11.7m in length x 4m in length x 3.9m in height (refer to **Figure 3.10 BESS Switchroom [EN010140/APP/6.2.3.10]**).

3.4.23. Due to the potential flood risk (identified in **Chapter 9 Water Environment [EN010140/APP/6.1.9]**) of the ES, the compound will be surrounded by an earth bund. The proposed earth bund will sit at least 600mm above the combined fluvial and tidal design flood level to protect the equipment from inundation.

3.4.24. Four water tanks sit at each entrance to the BESS compound, two of which are for the purpose of firefighting, (shown on Figure 4.3 BESS and Substation Preliminary Drainage Strategy Drawing [EN010140/APP/6.2.4.3] which will be secured through DCO requirement), up to an elevation of 3.65m above ground level and diameter of up to 3.45m (**Figure 4.4 Water Tank Elevations [EN010140/APP/6.2.4.4]**) . The attenuation basins located within the Substation and BESS Compound will have sufficient capacity to hold 228,000 ltires of fire water (1,900 litres per minute for two hours) and accommodate a 1-in-100 year storm event plus 30% allowance for climate change. The presence of a flood bund around the entire Substation and BESS Compound would contain any runoff within the bunded area in event of a fire/ storm event.

3.4.25. In order to ensure potentially contaminated water does not leach into the underlying aquifer, the BESS compound will be lined with an impermeable liner. Three attenuation basins (**Figure 4.3 BESS Drainage Strategy [EN010140/APP/6.2.4.2]**), will collect the runoff water from the impermeable liner, to ensure that flood risk is not increased elsewhere, before the clean water is discharged to existing drains via

penstock valves[7]. If water within the attenuation basins is identified as being contaminated, it will be removed from the Site using tankers for off-site treatment and disposal (this will be secured through DCO requirement).

Distribution Cables

3.4.26. Low voltage distribution cabling between solar PV modules and the field stations will typically be located above ground level fixed to the mounting structure, and then buried in trenches underground between the solar PV panels and the field stations. The dimensions of trenching will vary subject to the number of underground cables and the number of ducts they contain but will be up to 1.5m wide with a minimum depth of 0.9m, dependent on the method of installation and ground conditions.

3.4.27. Higher rated voltage cables (33kV) are required between field stations and the Substation. The 33kV cables will be buried underground in a trench up to 1.5m wide with a minimum depth of 0.9m. The flexibility to locate electrical and other cables within the Solar Farm Zone (as shown on **Figure 3.2 Parameter Plan [EN010140/APP/6.2.3.2]**) is required to ensure that the Proposed Development can be implemented as efficiently as possible.

3.4.28. The existing below-ground utilities across the Site are not proposed to be altered by the Proposed Development. Information on the easements relating to these assets has been obtained and incorporated into the design of the Proposed Development as part of the design process and are set out in **Figure 2.1 Utilities Plan [EN010140/APP/6.2.2.1]**. Cables will cross existing below-ground utility infrastructure at 90 degrees (perpendicular) to the alignment of the utility infrastructure. The cable crossings will be at least 600mm above or below the existing below ground utility infrastructure, in line with National Grid guidance[8]. There may be a requirement for trenchless drilling methods within the Solar Farm Zone to cross beneath existing belowground utility infrastructure and watercourses; the trenchless methods will have a maximum working width of up to 30m.

3.4.29. Data cables will be required throughout the Solar Farm Zone to allow for the monitoring during operation, such as the collection of data on solar irradiance from

[7] A sluice or water gates that control the flow of water.

[8] National grid T/SP/SSW/22

pyranometers[9]. The data cables would be installed within the same trench as the electrical cables.

Grid Connection Cables

3.4.30. The Site will connect to the National Grid substation at the Drax Power Station via underground cabling (refer to **Figure 3.2 Parameter Plan [EN010140/APP/6.2.3.2]** for the Underground Grid Connection Cable Area). The voltage for the underground grid connection cable will be up to 132kV. The dimensions of trenching will vary subject to the number of underground cables and the number of ducts they contain but open trenching will be up to 1.5m wide with a minimum depth of 0.9m, dependent on the method of installation and ground conditions.

3.4.31. Trenchless methods will be required to allow the grid connection cables to be installed under the railway near Drax Power Station (details will be secured through a DCO requirement). The width of the trenchless drilling area is expected to be 1.2m subject to ground conditions. The maximum depth will be up to 10m below ground level but will be dependent on ground conditions, borehole entry and exit positions and requirements of the railway owner/operator. The contractor will establish a 50m x 50m working compound on each side of the working sections.

3.4.32. As stated in **Chapter 10 Transport and Access [EN010140/APP/6.1.10]**, access to the existing PRoWs will be maintained through all phases of the Proposed Development. Should temporary closures be required to ensure the safety of PRoW users, these will be for a short period during construction and decommissioning and alternate routes will be provided.

Utilities

3.4.33. The existing above-ground and below-ground utilities across the Site are not proposed to be altered by the Proposed Development[10]. Information on the easements relating to these assets has been obtained and incorporated into the design of the Proposed Development as part of the design process and are set out in **Figure 2.1 Utilities Plan [EN010140/APP/6.2.2.1]**.

[9] An instrument which measures solar irradiance.
[10] Should relocation or removal of existing utilities be required, this would be carried out in accordance with protective provisions identified in the DCO for the benefit of that statutory utility undertaker.

3.4.34. The Proposed Development would require below ground electricity and data cables to cross on-Site watercourses. To minimise effects, utility crossings of watercourses would be rationalised to minimise the number of crossings. Crossings of IDB maintained ordinary watercourses would be installed by trenchless methods under the channel of the watercourse and be based on the following design parameters:

- The utility crossing is within 10 degrees of perpendicular to the direction of flow in the watercourse;
- The utility crossing is at least 1.5m below the bed of the watercourse along its whole length, and the same height is maintained for at least 5m beyond each bank (measured from the top);
- The utility crossing does not pass through any bank, culvert, formal flood defence or other structure;
- Appropriate permanent hazard markers on both banks should be installed; and
- Works do not disturb the bed and banks of the watercourse.

3.4.35. The design process has accounted for the easements identified in Table 3.1.

Table 3.1: Summary of Utilities and Required Easements

Provider	Utility	Easement
Yorkshire Water	Water main	6m either side of centre line of pipe
	Sewer	6m either side of centre line of pipe
BT	Openreach Fibre	Along boundary
National Grid	NG Gas Pipeline	12.2m either side of centre line
Northern Powergrid	11kV Overhead Line	No structural planting below overhead line
	LV Overhead Line	No structural planting below overhead line
	66kV Overhead Line	No structural planting below overhead line
	400kV Overhead Line	No structural planting below overhead line

Fencing, Security and Ancillary Infrastructure

Fencing

3.4.36. As shown in **Figure 3.11 Fence and Gate [EN010140/APP/6.2.3.11]**, the Proposed Development will be surrounded by plain wire deer fencing to a maximum height of

2.1m to the top of the gate post. Badger/ fox/ small mammal gates will be fitted at appropriate points to enable free access. Where wooden elements are used, these will be routinely replaced as required.

3.4.37. The BESS will be surrounded by a welded steel wire mesh fence, at a maximum height of 2.4m, as shown in **Figure 3.12 BESS Battery Fence and Gate [EN010140/APP/6.2.3.12].**

Construction Compounds

3.4.38. During the construction and decommissioning phases two primary compounds will be located within the Site, adjacent to the Site access/ egress points on the north-eastern boundary. The compounds will cover a total area of up to 4ha, will provide 80 employee parking spaces, and a heavy goods vehicle ('HGV') turning circle. The base material will be crushed stone. The compounds will provide storage for construction materials, equipment and plant, and for machinery including excavators, piling rig and dumper trucks. Welfare facilities (changing rooms, toilets, and canteen) and office units will also be provided.

3.4.39. Up to five secondary compounds will be provided, each up to 1ha in area. The secondary compounds will provide up to 10 parking spaces and an HGV turning circle. These compounds will also have a crushed stone base, and will provide welfare facilities (changing rooms and toilets), and a small storage area for equipment.

3.4.40. Foul water for both primary and secondary compounds will be stored and collected from Site, for removal to an off-site disposal facility.

CCTV and Lighting

3.4.41. Pole mounted internal facing CCTV will stand at a maximum of 3m as shown in **Figure 3.13 CCTV Elevations [EN010140/APP/6.2.3.13]**. CCTV will be mounted on a wooden pole; the wood will be routinely replaced throughout the operational phase to prevent deterioration.

3.4.42. CCTV cameras would use night-vision technology, which would be monitored remotely and avoid the need for night-time lighting. No areas of the solar PV arrays are proposed to be continuously lit. For security requirements, passive infra-red

detector ('PID') systems (or similar) will be installed around the perimeter of the solar PV arrays to provide night vision functionality for the CCTV.

3.4.43. During construction and decommissioning, lighting will be limited to the compounds only, with temporary lighting at the grid connection works. The lighting of the Substation and BESS compound would be in accordance with Health and Safety requirements, particularly around any emergency exits. Lighting requirements will be set out through the detailed Construction Environmental Management Plan ('CEMP') and detailed Decommissioning Environmental Management Plan ('DEMP'), to be secured through DCO requirement, an outline CEMP and outline DEMP are included in **Appendices 5.1 [EN010140/APP/6.3.5.1]** and **5.3 [EN010140/APP/6.3.5.3]**.

3.4.44. Lighting would be designed to limit any impact on sensitive receptors by directing lighting downward and away from the Site boundaries and existing vegetation. During operation, no part of the Proposed Development would be continuously lit; manually operated. PIR motion detection lighting would be utilised for operational and security purposes; operational lighting will be finalised through detailed design .

Permissive Footpath

3.4.45. As shown in **Figure 3.2 Parameter Plan [EN010140/APP/6.2.3.2]** the Proposed Development will provide Permissive Footpaths [11]during the operational lifetime of the development. The Permissive Footpaths will formalise access between existing 'Other Route with Public Access' and Public Footpaths on Site.

Access Tracks

3.4.46. As shown on **Figure 3.14 Construction Vehicle Route [EN010140/APP/6.2.3.14]**, vehicular access to the Site during the construction and decommissioning phases of the Proposed Development will be taken from two access/ egress points (at fields 15 and 18/19 as shown on Figure **3.1 Field Boundaries Plan [EN010140/APP/6.2.3.1]**) on the A1041 at the eastern boundary of the Site, as shown in **Figure 3.2 Parameter Plan [EN010140/APP/6.2.3.2]**. Access to the grid connection cable corridor will be taken from the A645.

3.4.47. During the operational phase, vehicular access will be limited to maintenance visits

[11] A route that a private landowner has voluntarily opened up to the public, to enable them to cross their land. It does not constitute a public right of way and the public do not have a legal right to use them.

and is anticipated to remain from the M62/ A645/ A1041 via the access/egress points identified above. **Figure 3.15 Internal Access Road Detail [EN010140/APP/6.2.3.15]** shows the track cross-section.

3.4.48. Internal access tracks will be up to 6m wide and constructed of permeable aggregate to enable drainage. Passing places will be provided to enable HGVs to pass, the location of these will be confirmed along the tracks.

Landscape and Ecological Enhancements

3.4.49. The existing hedgerows, woodland, ditches and ponds within the Site will be retained, with the exception of small breaks for new access tracks, security fencing and cable routing. Any hedgerow breaks or watercourse crossings will be kept to a minimum width. Where a cable route crosses a hedgerow, the hedgerow will be reinstated after construction. The minimum offsets have been set out in Table 3.2, providing a minimum distance from features within the Site from which to implement additional planting.

3.4.50. **Figure 3.16 [EN010140/APP/6.2.3.16]** shows the proposed Landscape Strategy Plan. Further details are provided in **Chapter 7 Landscape and Views [EN010140/APP/6.1.7]** and **Chapter 8 Biodiversity [EN010140/APP/6.1.8]** of this ES.

Archaeological Mitigation

3.4.51. The Proposed Development's Solar Farm Zones have evolved alongside the Cultural Heritage assessment in order to ensure the potential for effect on heritage assets is reduced. The mitigation proposed is as set out in the Archaeological Mitigation Strategy (**Appendix 6.2 [EN010140/APP/6.3.6.2]** of the ES) and **Chapter 6 Cultural Heritage [EN010140/APP/6.1.8]** of the ES, summarised as follows. Within areas of archaeological potential:

- Solar PV modules will be on ground mounted footings (with a maximum depth of up to 0.15m), with the cables raised up and clipped beneath the solar PV panels to avoid any requirement for a cable trench in these locations;
- CCTV mounts and fencing posts will be on ground footed mountings to a maximum depth of up to 0.15m (refer to **Figure 3.17 Elevations with Archaeological Mitigation [EN010140/APP/6.2.3.17])**; and

- Where access tracks are required over areas of archaeological potential, these will be raised above ground level, with a maximum topsoil strip depth of up to 30mm (less than plough depth) (refer to **Figure 3.18 Access Road with Archaeological Mitigation [EN010140/APP/6.2.3.18]**).

Weather Station

3.4.52. Pole mounted weather stations will stand at a maximum height of 3m with a maximum depth of 1.2, below grade, as shown in **Figure 3.19 Weather Station [EN010140/APP/6.2.3.19]**. A standard motor pier will hold a module, series parallel capacitor ('SPC') Antenna[12], and weather station. Weather stations will generally be placed adjacent to inverters, therefore located within the Solar Farm Zone, and will allow more data to be gathered on site and monitor the performance of the Solar PV Modules taking into account weather conditions.

Operation, Maintenance and Restoration Phase

3.4.53. A modelled operational lifespan for the Proposed Development of up to 40 years (excluding decommissioning) has been assumed for the purposes of the assessments in the ES.

3.4.54. During the operational phase, the activities on-Site are expected to consist of maintenance activities, including servicing of plant and equipment and vegetation management.

3.4.55. Upon cessation of the modelled operational 40-year lifespan, the Proposed Development will be decommissioned, and the Site returned to arable use.

3.4.56. Temporary decommissioning compounds will be created to house necessary plant and equipment, and to provide areas for parking for employees; these will be provided in the same locations as those provided for the construction phase. These would be removed upon completion of the decommissioning phase. All the solar infrastructure including solar PV modules, mounting structures, cabling on or near to the surface, field stations, fencing and ancillary infrastructure, and the Substation and BESS compound would be removed and recycled or disposed of in accordance with good practice following the waste hierarchy, with materials being reused or recycled wherever possible. All waste will be disposed of in accordance with the

[12] Component that directs incoming and outgoing radio waves.

legislation at the time of decommissioning.

3.4.57. Decommissioning is estimated to take approximately 12 months and the Site will be decommissioned in line with detailed DEMP, to be secured as a requirement of the DCO, this is discussed further in **Chapter 5 Construction and Decommissioning Methodology and Phasing [EN010140/APP/6.1.5]**.

3.4.58. The effects of the decommissioning phase are expected to be similar to, or of a lesser magnitude than, the effects generated during the construction phase and have been considered in the relevant sections of the ES; this is because the decommissioning phase will also run for approximately 12 months, and similar activities will be undertaken. There is a degree of uncertainty regarding decommissioning, as engineering approaches and technologies will evolve over the operational life of the Proposed Development, and assumptions based on the reasonable worst-case scenario have therefore been made where appropriate, as discussed in the technical chapters.

Table 3.2: Summary of Parameters and Indicative Design Guidance for Assessment

Component		Parameter/ Design Guidance
Solar PV Modules		
Maximum Height of Panels	Up to 3m above existing ground levels	Parameter
Minimum Height of Panels	Up to 900mm above existing ground levels	
Minimum gap between panels	2m	
Maximum slope of PV Modules from the Horizontal	60°	
PV Module Material	Silicon glass and include an anti-reflective coating	Design Guidance
Mounting Structure Material	Anodised aluminium alloy or galvanized steel with rough matte finish	
Foundation Type	Piling or concrete feet foundation	
Maximum Depth of Piles	Up to 2.5m	Parameter
Field Station		
Maximum container dimensions	Up to 12.2m in length x 2.4m in width x 3.5 in height, including supports 600mm in height, above a 300mm deep gravel sub-base	Parameter
Indicative foundations	Concrete feet on a gravel sub-base	Design Guidance
Indicative colour	In keeping with the prevailing surrounding environment, painted dark green	
Substation and BESS Compound		
Maximum On-Site 132kV Substation dimensions	Up to 6.48 in height, including supports 600mm in height	Parameter
Maximum height of BESS	Up to 6.48m	
Maximum Battery Container dimensions	Up to 12.2m in length x 2.4m in width x 3.5 in height, including supports 600mm in height	
Maximum Control Room dimensions	Up to 6m in length x 3m in width x 5.7m in height	
Maximum Inverter/Transformer dimensions	Up to 6.1m in length x 2.4m in width x 3.5 in height, including supports 600mm in height	
Maximum Switchroom dimensions	Up to 11.7m in length x 4m in length x 3.9m in height	
Maximum flood bund dimensions	At least 600mm above the combined fluvial and tidal design flood level.	
Maximum water tank dimensions	Up to an elevation of 3.65m above ground level and diameter of up	

	to 3.45m	
Distribution and Grid Connection Cables		
Trench Dimensions for Distribution Cables	Up to 0.9m in depth and 1.5m in width (typically 20m working width for trenchless drilling method)	Parameter
Trench Dimensions for Grid Connection Cables	Up to 0.9m in depth and 1.5m in width (typically 1.2m working width and up to 10m in depth for trenchless drilling method)	
Fencing		
Fence Type (Solar PV Site)	Plain wire, deer fencing	Design Guidance
Maximum Fence Post Height	Up to 2.1m	Parameter
Maximum Fence Height	Up to 2m	
Mammal gates	Included	Design Guidance
Fence Type (Onsite Substation and BESS Compound)	Welded steel wire mesh	
Maximum Fence Post Height	Up to 2.4m	Parameter
Maximum Fence Height	Up to 2.4m	
Construction Compounds		
Maximum Primary Construction Compound	Two compounds	Parameter
Primary Construction Compound footprint	Up to 4ha	Design Guidance
Primary Construction Compound material	Crushed stone	
Maximum Secondary Construction Compound	Up to five compounds	Parameter
Secondary Construction Compound footprint	Up to 1ha each	
Secondary Construction Compound material	Crushed stone	Design Guidance
Security		
CCTV Type	Night-vision technology	Design Guidance
CCTV Support Column Material	Wooden Pole, routinely replaced as required due to deterioration	
Maximum CCTV Support Column Height	Up to 3m	Parameter
Lighting	PIR, pole-mounted or building mounted internal facing	Design Guidance
Internal Access Road		
Maximum internal width	Up to 6m	Parameter
Material	Permeable aggregate	Design Guidance
Drainage	Permeable aggregate	
Landscape and Ecological Enhancements		
Minimum offset from woodland to solar infrastructure	15m	Design Guidance per Natural England guidance
Minimum offset from Site boundary hedgerows	5m	

(internal and external) to solar infrastructure		
Minimum offset from ponds to solar infrastructure	30m	
Minimum offset from ditches to solar infrastructure	6m	
Minimum offset from watercourse to solar infrastructure	7m	Design Guidance per Selby Internal Drainage Board
Archaeological Mitigation		
Ground footed mountings for solar PV modules, fence posts and CCTV posts where over an area of archaeological potential	Up to 0.15m	Parameter
Maximum topsoil strip depth of access road where over an area of archaeological potential	Up to 0.3m	
Weather Station		
Maximum Height of Weather Station Standard Motor Pier	3m	Parameter
Maximum Depth of Weather Station Standard Motor Pier	1.2m	