Light Valley Solar

Environmental Statement Volume 1

Chapter 2: The Proposed Development

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Chapter 2: The Proposed Development

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2 The Proposed Development

2.1 Introduction

2.1.1 This chapter of the Environmental Statement (ES) provides a description of the physical characteristics of the Proposed Development and the activities that would be undertaken during the construction, operation, and decommissioning phases. The description contained within this chapter informs each of the technical assessments within ES Volume 1, Chapter 5 to Chapter 16 [**EN0110012/APP/LVS/06.01**].

2.1.2 This chapter is supported by the following figures in ES Volume 2 [**EN0110012/APP/LVS/06.02**]:

1) Figure 1.1: Site Location Plan and Order Limits.
2) Figure 1.2: Elements of the Proposed Development.
3) Figure 2.1: Illustrative Site Layout Plan. This outlines the indicative locations for the equipment included within the Proposed Development.
4) Figure 2.2: Cable Route Corridor Numbering.
5) Figure 2.3: Field Numbering Plan.
6) Figure 2.5: Avoidance Areas.
7) Figure 2.6: Concrete Feet Locations or other non-ground penetrative techniques.
8) Figure 2.7: Utilities.
9) Figure 2.8: HDD Sensitivity Testing.

2.1.3 This chapter is supported by the following appendices in ES Volume 3 [**EN110012/APP/LVS/06.03**]:

1) Appendix 2-1: Cable Route Construction Method Statement **[EN0110012/APP/LVS/06.03.02.01]**.

2.1.4 This chapter should be read alongside the following Development Consent Order (DCO) plans:

1) Works Plans [**EN110012/APP/LVS/02.03**]
2) Public Rights of Way Plans [**EN110012/APP/LVS/02.04**]
3) Street Plans [**EN110012/APP/LVS/02.06**]
4) Statutory and Non-Statutory Natural Environment Sites and Features Plan [**EN110012/APP/LVS/02.08**]
5) Statutory and Non Statutory Historic Environment Features Plan [**EN110012/APP/LVS/02.09**]
6) Tree Preservation Order and Hedgerow Plan [**EN110012/APP/LVS/02.10**]

7) Waterbodies in a River Basin Management Plan [**EN110012/APP/LVS/02.11**]

8) Outline Environmental Masterplan [**EN110012/APP/LVS/02.12**]

2.2 Site Description and Environmental Designations

2.2.1 Figure 1.1 Site Location Plan and Order Limits (ES Volume 2) [**EN110012/APP/LVS/06.02.01.01**] is made up of four broad areas:

1) Solar Development Sites (total area of 900 hectares (ha);

2) Cable Route Corridor (total area of 328.5 ha);

3) Highways Improvements Areas (HIA) (total area of 17.1 ha); and

4) Solar Development Site 8 Access (total area of 24.1 ha).

2.2.2 The total area within the Order Limits is approximately 1,270 ha.

2.2.3 The Solar Development Sites are split across a total of seven separate land parcels as presented in Figure 2.1: Illustrative Site Layout Plan (ES Volume 2) [**EN0110012/APP/LVS/06.02.02.01**].

2.2.4 Descriptions of each Solar Development Site 1-4 and 6-8, including current land use and environmental designations, are provided in the following sections.

Solar Development Site 1

2.2.5 Solar Development Site 1 (Figure 1.1 Site Location Plan and Order Limits (ES Volume 2) [**EN0110012/APP/LVS/06.02.01.01**]) is the most northerly site and is located approximately 575 m east of Escrick village, a civil parish, and approximately 9 km south of York. The site is located approximately 20 km north-east of Monk Fryston Substation. The site covers an area of 344.8 ha. There are numerous farm buildings within the site (outside the Order Limits) including Tileshed Farm, Manor Farm and Mount Pleasant Farm. There are three Public Rights of Way (PRoW) within the site.

2.2.6 The main current land use within Solar Development Site 1 is agricultural. Additionally there are small areas of woodland both within the site and predominately outside the Order Limits.

2.2.7 The fields are bounded by hedgerows and sporadic trees with single trees dotted within the site. There are National Forest Inventory Woodlands located adjacent to the Order Limits of Solar Development Site 1. There are two areas of ancient woodland (identified from Natural England's Ancient Woodland Inventory) directly adjacent to the eastern site boundary of Solar Development Site 1, known as Gilbertson's Wood.

2.2.8 The topography of the site is undulating with a general slope down towards the south from 12 m above Ordnance Datum (AOD) in the north to 5 m AOD in the south.

2.2.9 There are no designated nature conservation sites located within the site. The Lower Derwent Valley group of designated sites including Ramsar, Special Protection Area (SPA), Special Area of Conservation (SAC), Site of Special Scientific Interest (SSSI) and National Nature Reserve (NNR) are located approximately 2.8 km east of the Order Limits for Solar Development Site 1. Skipwith Common SAC, SSSI and NNR are located approximately 2.4 km to the south-east. There are SSSI Impact Risk Zones (IRZ) for Derwent Ings SSSI within the site.

2.2.10 The site does not fall within Green Belt. The York / Selby Green Belt is located 175m to the north of the main section of Solar Development Site 1 (excluding the access point and track).

2.2.11 There are no Scheduled Monuments, Listed Buildings or Conservation Areas within the site. The nearest Scheduled Monument (Danes Hills square barrow cemetery on Crook Moor) is located approximately 1 km south-east and is enclosed by woodland. The nearest Conservation Area to the site is the Escrick Conversation Area, which extends beyond the development limits of Escrick village, and lies approximately 270 m to the north-west of the Order Limits for Solar Development Site 1.

2.2.12 There are no main rivers within the site. However, there are several Ouse and Derwent Internal Drainage Board (IDB) watercourses, ordinary watercourses and unnamed watercourses present in the site, including Whinchat Dyke, Chatterton Dyke and Pallion Dike. The site is susceptible to flooding from various sources. This is described in more detail in Chapter 15 Water Resources and Flood Risk.

2.2.13 The local transport network consists of Wheldrake Lane which is located just to the north of the northern boundary of the site and Skipworth Road west of the site. There is an existing, unnamed track that runs through the centre of the site and provides access to Mount Pleasant Farm and joins onto Wheldrake Lane and Skipwith Road.

2.2.14 Gilrudding Grange Airfield is located approximately 2.9 km north-west of the Order Limits for Solar Development Site 1 and is an unlicenced general aviation (GA) aerodrome. It is understood not to have an Air Traffic Control (ATC) tower and has one operational runway. Elvington Airfield is located approximately 4.1 km north of the Order Limits for Solar Development Site 1, and is an unlicenced GA aerodrome. It is understood not to have an ATC tower and has one operational runway. Acaster Malbis Airfield is located approximately 5.5 km west of the Order Limits for Solar Development Site 1 and is an unlicensed GA aerodrome. A control tower / watch office is present but is understood not to be used operationally.

2.2.15 There is an overhead 33kV line that follows the eastern boundary of the site from Wheldrake Lane and adjacent to Gilbertson's Wood. It runs between Gilbertson's Wood and Keldcarrs Plantation before exiting the site.

2.2.16 There is an overhead 11kV line within the site that is routed from the middle of the northern site boundary on Wheldrake Lane to the middle of the western site

boundary on Skipworth Road. There are three connections from this line to properties and to a wind turbine.

2.2.17 Two large diameter Yorkshire Water mains run across the southern part of site in a north east – south west alignment.

Solar Development Site 2

2.2.18 Solar Development Site 2 (Figure 1.1 Site Location Plan and Order Limits (ES Volume 2) [**EN110012/APP/LVS/06.02.01.01**]) borders the east-bound carriageway of the A63 approximately 1.4 km east of the junction of Water Lane and the A63 in Monk Fryston. The site covers an area of 83.3 ha.

2.2.19 The site is located approximately 3.5 km north-east of Monk Fryston Substation. Siddle Farm House, Fryston Common Farm and Oak Tree Farm buildings are adjacent to the site. The site is predominantly agricultural land with an existing access track running down the centre and is also surrounded on all sides by agricultural fields. There are no PRoWs within the site.

2.2.20 The site is partially within the Green Belt (Selby Local Plan 2013) (Ref 1).

2.2.21 The topography of the site is relatively flat at an elevation of approximately 10 m AOD.

2.2.22 There are no designated nature conservation sites within the site. The nearest designated site is Sherburn Willows SSSI, located approximately 3.8 km north-west of the Order Limits for Solar Development Site 2.

2.2.23 There are no Scheduled Monuments, Listed Buildings or Conservation Areas within the site. The nearest Listed Building is located adjacent to the southern boundary (Grade II Listed milestone) and the nearest Scheduled Monument (Steeton Hall medieval magnate's residence and manorial centre) is located approximately 3.7 km north-west of the Order Limits for Solar Development Site 2.

2.2.24 There are no main watercourses in the site. Several Selby Area IDB watercourses, ordinary watercourses and unnamed watercourses are present in the site, including Fleet Dike and Causeway Dyke. The site is susceptible to flooding from various sources. This is described in more detail in Chapter 15 Water Resources and Flood Risk (ES Volume 1) [**EN110012/APP/LVS/06.01.15**].

2.2.25 The local transport network consists of Fryston Common Lane which cuts through the north of the site. The A63 runs parallel to the southern boundary with an unnamed road running vertically through the centre of the site connecting the A63 and Fryston Common Lane. The A63 provides connection between the A1(M) and Selby.

2.2.26 Sherburn in Elmet Airfield is located approximately 1.4 km north of the Order Limits for Solar Development Site 2 and is a licenced GA aerodrome. It is understood not to have an ATC tower and has four operational runways.

2.2.27 There is an overhead 132 kV line that crosses the very edge of the south east corner of the site.

2.2.28 There is an overhead 11 kV line that is routed north-south adjacent to the unnamed road running through the centre of the site. Overhead 11kV continue along the north eastern boundary of the site as well as across the north western part of the site.

2.2.29 Three large diameter Yorkshire Water mains cross the site in roughly east – west orientations.

Solar Development Site 3

2.2.30 Solar Development Site 3 (Figure 1.1 Site Location Plan and Order Limits (ES Volume 2) [**EN110012/APP/LVS/06.02.01.01**]) is located approximately 850 m to the south-east of the junction of Hillam Lane, Lumby Hill and Chapel Street in Hillam. The site is located approximately 3.1 km east of Monk Fryston Substation. The site covers an area of 19.9 ha. Hillam Common Lane runs along the northern perimeter of the site with Woodlands Lane running along the south. The area within the site is made up of agricultural land without any hedgerows along the boundary. There are no PRoWs within the site.

2.2.31 The site is entirely within the Green Belt (Selby Local Plan 2013) (Ref 1).

2.2.32 The topography of the site is relatively flat at an elevation of approximately 10 m AOD.

2.2.33 There are no designated nature conservation sites located within the site. The nearest designated site is Fairburn and Newton Ings SSSI located approximately 4.3 km west. However, the site does lie within the Impact Risk Zone (IRZ) of Fairburn and Newton Ings SSSI.

2.2.34 There are no scheduled monuments, Listed Buildings or Conservation Areas within the site. The nearest Scheduled Monument (Danes Hills square barrow cemetery on Crook Moor) is located approximately 4.2 km north-east of the Order Limits for Solar Development Site 3 and is enclosed by woodland. The nearest Listed Building (Grade II listed summerhouse in grounds of Millstone lodge) is located approximately 500 m west of the Order Limits for Solar Development Site 3. The nearest Conservation Area (Hillam Conservation Area) is approximately 500 m to the west of the Order Limits for Solar Development Site 3.

2.2.35 There are no main watercourses in the site. Several Selby Area IDB watercourses, ordinary watercourses and unnamed watercourses are present in and around the site, including Maspin Moor Drain. The site is susceptible to flooding from various sources. This is described in more detail in Chapter 15 Water Resources and Flood Risk (ES Volume 1) [**EN110012/APP/LVS/06.01.15**].

2.2.36 The A63 provides connection between the A1(M) and Selby and is located approximately 860 m north.

2.2.37 Sherburn in Elmet Airfield is located approximately 3.3 km north of the Order Limits for Solar Development Site 3 and is a licenced GA aerodrome. It is understood not to have an ATC tower and has four operational runways.

2.2.38 No utilities have been identified within the site.

Solar Development Site 4

2.2.39 Solar Development Site 4 (Figure 1.1 Site Location Plan and Order Limits (ES Volume 2) [**EN110012/APP/LVS/06.02.01.01**]) is located approximately 280 m north-east of the junction of Main Street, Roe Lane and Haddlesey Road in Birkin. The site is located approximately 4 km east of Monk Fryston Substation. The site covers an area of 283.8 ha and comprises numerous agricultural fields which are bounded by Haddlesey Road to the south and Roe Lane to the west. Bowers House Farm sits within the site, as does Woodhouse Farm. Gateforth Common and Gateforth Wood is located adjacent to the northern boundary. There are three PRoWs within the site.

2.2.40 The site is partially within the Green Belt (Selby Local Plan 2013) (Ref 1).

2.2.41 The topography of the site is relatively flat at an elevation of approximately 10 m AOD.

2.2.42 There are no designated nature conservation sites located within the site. The nearest designated site is Fairburn and Newton Ings SSSI located approximately 5.3 km west. The site lies within the IRZ of Fairburn and Newton Ings SSSI.

2.2.43 There are no scheduled monuments, Listed Buildings or Conservation Areas within the site. The Scheduled Monument ‘Roman fort’ is located approximately 1.3 km to the south-east of the Order Limits for Solar Development Site 4. The nearest Grade II Listed Building (Birkin House) is located approximately 90 m south-west. The nearest Grade I Listed Building is the Church of St Mary, located approximately 540 m south.

2.2.44 There are no main watercourses in the site. Several Selby Area IDB watercourses, ordinary watercourses and unnamed watercourses are present in and around the site, including Moor Drain, Maspin Moor Drain, Mearley Drain and Fleet Drain. The site is susceptible to flooding from various sources. This is described in more detail in Chapter 15 Water Resources and Flood Risk (ES Volume 1) [**EN110012/APP/LVS/06.01.15**].

2.2.45 The local transport network consists of Roe Lane and Haddlesey Road which are located on the western and southern edges of the site respectively. The site also borders around Twinkers Lane. The A63 is the nearest, large transport connection and is located approximately 1.3 km north.

2.2.46 Bridge Cottage Airstrip is located approximately 6.5 km south-east of the Order Limits for Solar Development Site 4 and is an unlicenced GA aerodrome. It is understood not to have an ATC tower and has two operational runways.

2.2.47 A high-pressure gas transmission main runs approximately east to west through the centre of the site. There are overhead high voltage power lines belonging to

both National Grid and Northern Power Grid crossing the site from north west to south east. There are several lengths of overhead 11 kV lines in the south and centre of the site including connections to the various properties and infrastructure in the vicinity.

Solar Development Site 5

2.2.48 Solar Development Site 5, as presented at Scoping and at non-statutory consultation, has been removed from the Proposed Development. Chapter 3: Alternatives and Design Iteration (ES Volume I) **[EN00110012/APP/LVS/ 06.01.03]** and Appendix 3.1: Site Selection Report (ES Volume 3) **[EN00110012/APP/LVS/ 06.01.03.01]** sets out the site selection process for the Proposed Development.

Solar Development Site 6

2.2.49 Solar Development Site 6 (Figure 1.1 Site Location Plan and Order Limits (ES Volume 2) [**EN110012/APP/LVS/06.02.01.01**]) is located approximately 500 m north of Monk Fryston and 540 m east of South Milford. The site covers an area of 99.6 ha.

2.2.50 The Milford Curve rail line runs along the western edge slewing north and east to join the Leeds to Selby Line (HUL3) to the north of the site.

2.2.51 The topography of the site is relatively flat at an elevation of approximately 9 m AOD.

2.2.52 There are no designated nature conservation sites located within the site. The nearest designated site is Sherburn Willows (SSSI) which is located approximately 2.1 km north-west of the site boundary.

2.2.53 There are no Scheduled Monuments, Listed Buildings or Conservation Areas within the site. The nearest Listed Building (Grade II listed Common Lane Bridge) is located approximately 535 m north-west of the Order Limits for Solar Development Site 6. The nearest scheduled monument (Steeton Hall medieval magnate's residence and manorial centre) is located approximately 2 km west of the site boundary.

2.2.54 The local transport network consists of Common Lane which runs through the site, and Turpin Lane, off Common Lane, runs south alongside the Milford Curve rail line turning east before continuing south towards Ingthorne Lane. Sherburn in Elmet Airfield is located approximately 0.6 km north of the site

2.2.55 Sherburn in Elmet Airfield is located approximately 0.6 km north of the site boundary and is a licenced GA aerodrome. It is understood not to have an ATC tower and has four operational runways.

2.2.56 Lumby Common Drain, which is a Selby Area IDB watercourse, runs through the southern section of Solar Development Site 6. It is called Low Common Drain north of Common Road. Small sections of both the southern and northern sections of site 6 are susceptible to flooding from various sources. This is

described in more detail in Chapter 15 Water Resources and Flood Risk (ES Volume I) [**EN110012/APP/LVS/06.01.15**].

2.2.57 There are several lengths of overhead 11kV lines running through the site and Northern Power/Northern Power Grid LV lines on the site boundary.

Solar Development Site 7

2.2.58 Solar Development Site 7 (Figure 1.1 Site Location Plan and Order Limits (ES Volume 2) [**EN110012/APP/LVS/06.02.01.01**]) is located approximately 510 m east of South Milford. The site is the smallest of the seven sites and covers an area of 8.7 ha. The southern edge of the site runs adjacent to Common Lane. Normanton and Colton Junction railway line runs to the west of the site and the Leeds to Selby Line (HUL3) railway line runs adjacent to the northern edge of the site.

2.2.59 The topography of the site is relatively flat at an elevation of approximately 9 m AOD.

2.2.60 There are no designated nature conservation sites located within the site. The nearest designated site is Sherburn Willows (SSSI) which is located approximately 1.8 km north-west of the Order Limits for Solar Development Site 7.

2.2.61 There are no Scheduled Monuments, Listed Buildings or Conservation Areas within the site. The nearest Listed Building (Grade II listed Common Lane Bridge) is located approximately 20 m north-west of the site boundary. The nearest scheduled monument (Steeton Hall medieval magnate's residence and manorial centre) is located approximately 2 km west of the site boundary.

2.2.62 The local transport network consists of Common Lane which is located along the south of the site.

2.2.63 Sherburn in Elmet Airfield is located approximately 1.4 km north-east of the site boundary and is a licenced GA aerodrome. It is understood not to have an ATC tower and has four operational runways.

2.2.64 No main rivers run through the site. An unnamed drain runs adjacent to the eastern boundary of the site. Small sections of the site are susceptible to surface water flooding. This is described in more detail in Chapter 15 Water Resources and Flood Risk (ES Volume I) [**EN110012/APP/LVS/06.01.15**].

2.2.65 Network Rail sewers and BT Openreach lines run along the site boundaries.

Solar Development Site 8

2.2.66 Solar Development Site 8 (Figure 1.1 Site Location Plan and Order Limits (ES Volume 2) [**EN110012/APP/LVS/06.02.01.01**]) is located approximately 700 m north-west of Hambleton. The site covers an area of 60.0 ha. The southern edge of the site runs adjacent to the Leeds to Selby Line (HUL3) railway line. Philip Lane runs adjacent to the eastern edge of the site.

2.2.67 The topography of the site slopes from approximately 9 m AOD in the south down to 6 m AOD in the north.

2.2.68 There are no designated nature conservation sites located within the site. The nearest designated site is Sherburn Willows (SSSI) which is located approximately 4.7 km west of the Order Limits for Solar Development Site 8.

2.2.69 There are no Scheduled Monuments, Listed Buildings or Conservation Areas within the site. The nearest Listed Building (Grade II listed milestone approximately 200 m west of Bar Lane) is located approximately 905 m south of the Order Limits for Solar Development Site 8. The nearest scheduled monument (World War II bombing decoy control building 270 m south of Scalm Park Cottages) is located approximately 2 km east of the Order Limits for Solar Development Site 8.

2.2.70 The local transport network consists of Philip Lane which is located along the east of the Order Limits for Solar Development Site 8.

2.2.71 Sherburn in Elmet Airfield is located approximately 1.5 km west of the site boundary and is a licenced GA aerodrome. It is understood not to have an ATC tower and has four operational runways.

2.2.72 Leeds East Airport is located approximately 4.3 km north of the site boundary and is a licenced aerodrome which is used for private flights and general aviation flying. It has one operational runway.

2.2.73 No main rivers run through the site. Habholme Dike runs adjacent to the western edge of the site and an unnamed drain runs to the east of the site. Sections of the site are susceptible to flooding from various sources. This is described in more detail in Chapter 15 Water Resources and Flood Risk (ES Volume 1) [**EN110012/APP/LVS/06.01.15**].

2.2.74 There are several lengths of overhead 11 kV and 33 kV lines running through the site and other Northern Power Grid lines running along the site boundary.

2.3 Cable Route Corridor

2.3.1 The land uses within the Cable Route Corridor are predominantly agricultural land with local farm holdings. In some areas, the Cable Route Corridor is crossed by highways (including the A19 and A63), rail lines and the River Ouse.

2.3.2 Each Cable Route Corridor is named CRC (standing for 'Cable Route Corridor') and the corresponding numbers of the Solar Development Sites they connect, as outlined below.

CRC 1-4 - from Solar Development Site 1 to Solar Development Site 4

2.3.3 This corridor is the longest of the Cable Route Corridors and is approximately 19 km in length. The route crosses the A19, the River Ouse, Selby Dam, National Rail lines, the A63 and other smaller roads.

CRC 1-4a – alternative route from Solar Development Site 1 to Solar Development 4

2.3.4 Alternative Cable Route Corridor from Solar Development Site 1 to Solar Development Site 4 which crosses over Fox Lane. The route is approximately 1.6 km in length. This Cable Route Corridor is an offshoot from CRC 1-4 and connects into CRC 2-4. The inclusion of the alternative route is explained in Chapter 3: Alternatives (ES Volume 1) **[EN0110012/APP/LVS/06.01.03]**.

CRC 2-4 - from Solar Development Site 2 to Solar Development Site 4

2.3.5 This corridor is approximately 1.4 km in length and crosses over the A63 and Hillam Common Lane.

CRC 2-6 - from Solar Development Site 2 to Solar Development Site 6

2.3.6 This corridor is approximately 1.5 km in length and crosses over Fryston Common Lane.

CRC 3-4 and 3-4a – from Solar Development Site 3 to Solar Development Site 4

2.3.7 The corridor for CRC 3-4 is approximately 437 m in length and runs through a single agricultural field with no water or road/rail crossings.

2.3.8 The corridor for CRC 3-4a is approximately 726 m in length and crosses Stocking Lane. The inclusion of an alternative route is explained in Chapter 3: Alternatives (ES Volume 1) **[EN0110012/APP/LVS/06.01.03]**.

CRC 6-7 - from Solar Development Site 6 to Solar Development Site 7

2.3.9 The corridor is approximately 148 m in length and crosses over National Rail lines and Common Lane.

CRC 2-8 – from Solar Development Site 2 to Solar Development Site 8

2.3.10 The corridor is approximately 1.4 km in length and crosses over the Leeds to Selby Line (HUL3) railway line and Common Lane.

CRC 4-POC - from Monk Fryston Substation to Solar Development Site 4

2.3.11 The corridor is approximately 4.9 km in length and crosses over the A162, National Rail lines, Hillam Lane, Fairfield Lane and Roe Lane.

2.4 Description of the Proposed Development

The Proposed Development

2.4.1 The Proposed Development comprises a solar photovoltaic (PV) electricity generating station of over 100 megawatts (MW) and associated development comprising Battery Energy Storage System (BESS), substations, grid connection infrastructure and other infrastructure integral to the construction, operation and maintenance, and decommissioning phases. A general arrangement across the Solar Development Sites is presented in Figure 2.1: Illustrative Site Layout Plan (ES Volume 2) **[EN0110012/APP/LVS/06.02.02.01]** and in the Outline Environmental Masterplan [**EN110012/APP/LVS/02.12**] although it is noted that this general arrangement is illustrative and does not form the basis of assessment for the Proposed Development, which is based on the limits of deviation shown on the Works Plans **[EN0110012/APP/LVS/02.03]** and the matters secured via the Design Parameters and Commitments Document **[EN0110012/APP/LVS/05.06]**.

2.4.2 The principal infrastructure of the Proposed Development will be as follows:

1) Solar PV modules and mounting structures;
2) Conversion Units and 33kV Switchrooms;
3) Transformers;
4) Extra high voltage (EHV) switchgear and control equipment (housed inside a building);
5) Onsite electrical compounds comprising Substations, control buildings and associated equipment;
6) Onsite cabling;
7) A Battery Energy Storage System (BESS);
8) On-site and Interconnecting Cables: underground electrical cable routes within the Solar Development Sites, and underground electrical cable routes (located within the Cable Route Corridors to connect the solar infrastructure (located within the Solar Development Sites 1-4 and 6-8) to each other;
9) Grid Connection Cables: underground electrical cable routes to connect the Proposed Development to the National Grid at Monk Fryston Substation, routing from Solar Development Site 4 to Monk Fryston Substation and with an option to extend to Solar Development Site 2;
10) 275 kV cable connection within the existing Monk Fryston Substation and associated works to connect into the substation;
11) Spare parts storage buildings or enclosures and back-up generators;
12) Fencing and security measures;
13) Access tracks;

14) Environmental mitigation / biodiversity net gain; and

15) Temporary works will also be required to facilitate construction, including, temporary construction compounds, haul roads and highway alterations.

2.4.3 The solar PV modules will be mounted on either fixed or tracking structures, arranged in rows across the Solar Development Sites. A BESS will be installed and is intended to store surplus electricity generated by the solar PV system and/or energy from the grid. Supporting infrastructure will include On-site Cabling to connect the PV modules to the Conversion Units, as well as the switch rooms, substations and other electrical equipment necessary for grid export. Electricity will be transmitted via underground cables within the Cable Route Corridor to connect to the Existing National Grid Monk Fryston Substation. Works at the Existing National Grid Monk Fryston Substation involve the addition of new electrical infrastructure and associated civil works to comprise a new 275 kV feeder bay to connect the Grid Connection Cables for the Proposed Development.

2.4.4 The Solar Development Sites would have a combined area of 900 hectares (ha) and are located in North Yorkshire. The Solar Development Sites will include the Solar PV modules, BESS (located only within the BESS Compound within Solar Development Site 2), Substations, Conversion Units / Transformers, Access tracks, Fencing and security measures, and Environmental mitigation /biodiversity net gain.

2.4.5 Highways Improvements Areas (refer to ES Volume 2, Figure 1.2 [**EN110012/APP/LVS/06.02.01.02**]) are sections of the highway network that will contain localised improvements, such as improvements to the road edge where it is deteriorated and provision of temporary passing places within the existing highways boundary, traffic management, and provision of visibility splays, or temporary highway and traffic works required to safely accommodate the Abnormal Indivisible Load (AIL) deliveries. These areas will support the movement of construction vehicles on narrower sections of the local highway network within parts of the construction vehicle routes to the Site (refer to ES Volume 1, Chapter 14: Traffic and Movement [**EN110012/APP/LVS/06.01.14**]).

2.4.6 The Solar Development Site 8 Access area will provide optionality to access Solar Development Site 8 from the north of the site. As part of the possible access route, a new access road culvert may be needed on one moderate value watercourse, Habholme Dike. Additionally, the potential access road to the north of Solar Development Site 8 will cross over Selby Dam, a high value watercourse. There is currently an existing culvert crossing Selby Dam, however the condition of the culvert is not known at present. As a worst case scenario, the existing culvert may need to be removed and replaced with a new crossing structure. During the replacement of the culvert (if required) a temporary crossing structure would be installed to maintain current access provision if access could not be maintained over the current structure during the replacement works. If a temporary crossing structure is required it is considered that the structure would likely to be in place for less than 6 months.

The Order Limits

2.4.7 The Order Limits outline the maximum extent of the land that will be required to facilitate the construction, operation and maintenance, and decommissioning of the Proposed Development and are shown on the Works Plans [**EN0110012/APP/LVS/02.03**] and Location Plan [**EN0110012/APP/LVS/02.01**]. The Proposed Development would be located within the Order Limits, also referred to as 'the Site'. The Order Limits contain all elements of the Proposed Development comprising the Solar Development Sites, the Cable Route Corridor, connection works into the National Grid Monk Fryston Substation, the Highways Improvements Areas (shown in ES Volume 2, Figure 1.2 [**EN0110012/APP/LVS/06.02.01.02**] and the Solar Development Site 8 Access.

2.4.8 The Order Limits cover an area of 1,270 ha located within the administrative area of North Yorkshire Council, near Selby.

Works Packages

2.4.9 The Proposed Development is also described in the Draft DCO [**EN110012/APP/LVS/03.01**] where the 'authorised development', as described in this chapter is divided into spatial works packages. Note that the works package areas overlap, as shown on the Works Plans [**EN0110012/APP/LVS/02.03**].

Ancillary Works

2.4.10 The Proposed Development includes ancillary works in connection with or related to the identified works packages in draft DCO [**EN0110012/APP/LVS/03.01**] including fencing, gates, boundary treatment and other means of enclosure; bunds, embankments, trenching and swales; irrigation systems; drainage systems; works to services and utilities connections; alter watercourses; ramps, bridges and means of access; security and monitoring measures; improvement, maintenance and use of existing private tracks; footpath diversions and enhancement; signs and information boards; landscaping and related works; habitat creation and enhancement; site establishment and preparation works; earthworks and excavations; works for the protection of buildings and land; works to maintain and repair streets and access roads; tunnelling, boring and drilling works; and other works to mitigate any likely significant adverse effects from the construction, maintenance, operational or decommissioning phases of the Proposed Development.

2.4.11 The draft DCO [**EN0110012/APP/LVS/03.01**] provides for ancillary or related works to the numbered Works within that Schedule (as referenced below) to be carried out at any location within the Order limits. These works are therefore assessed within the ES as being able to take place throughout the Order Limits.

The Rochdale Envelope

2.4.12 The EIA presented within this ES has been undertaken adopting the principles set out in the Planning Inspectorate's Advice Note Nine: Rochdale Envelope (Ref 2) which provides guidance regarding the degree of flexibility that may be considered appropriate within an application for development consent under the Planning Act 2008 (Ref 3). The advice note acknowledges there may be aspects of the Proposed Development design that are not yet fixed and, therefore, it may be necessary for the EIA to assess likely worst-case variations to ensure all foreseeable significant environmental effects of the Proposed Development are considered.

2.4.13 Whilst it is inherent in the DCO process that flexibility can be built into the Scheme, the Works Plans **[EN0110012/APP/LVS/02.03]** indicate the maximum spatial extents within which the different types of development discussed in this chapter (save for the Ancillary Works discussed above) can be located and this has informed the assessment of environmental impacts.

2.4.14 Aspects of the Proposed Development that require design flexibility include, but are not limited to, the arrangement of the:

1) Solar PV Panels and panel type/specification;
2) Conversion Units and 33 kV Switch Rooms;
3) Associated Development such as the BESS Compound, and Substations; and
4) Grid Connection Cables and Interconnecting Cables, i.e. the routing of the cables within the Cable Route Corridor.
5) Electrical design of the Proposed Development – maximum parameters for the Cable Route and Substations have been defined to allow for this flexibility.
6) Access arrangements – Solar Development Site 8 is located in a site that is bordered to the south by a railway line. Currently access to Solar Development Site 8 is located on the eastern boundary of the site, which is accessed via a level crossing on Phillip Lane. This access is feasible for use for the Proposed Development but requires HGVs to use the level crossing to cross the railway corridor. Whilst Network Rail has indicated that this may be acceptable, the Applicant is conscious that the railway is a live operational asset and that circumstances at the time of construction (such as railway works) may mean that access will not be able to be taken when it is needed. The Order limits therefore allow for alternative accesses into Solar Development Site 8 to ensure that access can be taken at all times, including by avoiding crossing the railway if necessary

2.4.15 It is necessary that there will be some flexibility built into the design of the Proposed Development when submitting the DCO Application so that the detailed design of the Proposed Development can be informed by technical considerations, post-consent work, and take advantage of innovation in

technology. This is of particular importance in order to maintain flexibility due to the rapid pace of change in solar PV and battery storage technology, whilst maintaining a robust and comprehensive assessment of potential effects. Where such flexibility or optionality is required, this is explained throughout this chapter and in the parameters set out below.

2.4.16 The technical assessments therefore assess an 'envelope' within which the works would take place (the Rochdale Envelope). As such, the DCO Application and EIA is based on maximum and, where relevant, minimum parameters. These parameters have been considered in detail by technical authors as part of the EIA to ensure the realistic worst-case effects of the Proposed Development are assessed for each potential receptor. The parameters are set out below.

Design Parameters

2.4.17 The parameters assessed within this ES are described in detail in Table 2-1. Each technical chapter has assessed the likely worst-case scenario for that discipline in order to determine effect significance based on these parameters.

2.4.18 Whilst illustrative layout plans have been included in the DCO Application (Figure 2.1 **[EN0110012/APP/LVS/06.02.02.01]** this represents only one example of how the Proposed Development could be developed in accordance with the Design Parameters and Commitments Document **[EN0110012/APP/LVS/05.06]**. The ability of the Applicant to micro-site during construction is an important consideration and this may be required to reflect any technological advancement or changes in plant design or shape.

2.4.19 The Design Parameters and Commitments Document [**EN0110012/APP/LVS/05.06**] submitted as part of the DCO Application provides the maximum parameters for the detailed design of the Proposed Development and is secured by a requirement in the Draft DCO [**EN110012/APP/LVS/03.01**]. When the detailed design for the Proposed Development is submitted for approval to the relevant planning authorities, those details must accord with the Design Parameters and Commitments Document [**E110012/APP/LVS/05.06**]. This ensures that the environmental effects (of the detailed design) would be the same as, or no worse than, those assessed and reported in the ES. See section 2.6 for further details on the Design Principles of the Proposed Development.

2.4.20 In light of all of the above, the ES and the assessments within it are therefore based on the works described in this chapter, as reflected in the draft DCO **[EN0110012/APP/LVS/03.01]**, the limits of deviation shown on the Works Plans **[EN0110012/APP/LVS/02.03]** and the matters secured through the Design Parameters and Commitments Document [**EN0110012/APP/LVS/05.06**].

Table 2-1 Design Parameters for the Environmental Statement

Proposed Development component	Component type	Indicative component parameters
Solar PV Panels	Solar PV Panel type	Solar PV Panels will be bifacial monocrystalline panels, comprising two layers of toughened, low reflectivity glass.
	Solar PV Panel colour	The solar modules will be either black or dark blue.
Solar PV Mounting Structures	Material	Metal frame holding the solar panels in rows.
	Installation	Solar PV Panels would be secured via metal posts driven into ground to an approximate depth of 1.5 m to 4 m (dependant on ground conditions). In areas where archaeological protection is required, concrete feet or other non-ground penetrative techniques would be used. Figure 2.6: Solar Panels Concrete Feet or Other Non-Ground Penetrative Techniques **[EN110012/APP/LVS/06.02.02.06]** shows the locations where concrete feet or other non-ground penetrative techniques will be used and these have been taken into account in the assessment. The exact locations of where archaeological protection is required will be confirmed in the final Construction Environment Management Plan (CEMP) to be produced at detailed design stage (as outlined within the Outline CEMP (oCEMP) [**EN0110012/APP/LVS/07.02**].
Tracking Solar PV Tables (Option A)	Indicative orientation	Variable +/- 60° aligned in north-south rows rotating east-west.
	Minimum height of the lowest part of the Solar PV Panel above ground level (AGL)	Solar PV Panels would have a minimum clearance of 0.4 m AGL at maximum tilt (+/- 60 degrees).
	Maximum height of Solar PV Panels AGL	Solar PV Panels would have a maximum height of 4.5 m AGL at maximum tilt (+/- 60 degrees). The maximum height when Solar PV Panels are horizontal would be 2.5 m AGL.

Proposed Development component	Component type	Indicative component parameters
	Separation distance between rows	Solar PV Panels would be positioned in rows with a minimum separation distance of 2.5 m at the closest point.
Fixed Solar PV Tables (Option B)	Indicative orientation	Solar PV Panels would be aligned in east-west rows of Solar PV Tables. The Solar PV Panels would be secured to fixed south facing Solar PV Tables with a fixed tilt angle of between +10 degrees to 35 degrees from horizontal.
	Minimum height of the lowest part of the Solar PV Panel AGL	Solar PV Panels would have a minimum clearance of 0.4 m AGL.
	Maximum height of Solar PV Panels AGL	Solar PV Panels would have a maximum height of 3.5 m AGL.
	Separation distance between rows	Solar PV Panels would be positioned in rows with a minimum separation distance of 2.5 m at the closest point.
Integrated Conversion Units	Maximum dimensions	15 m by 5 m and a maximum height of 3.5 m.
	Material	The Integrated Conversion Units would be housed in a metal container, externally finished in keeping with the prevailing surrounding environment, often with a grey painted finish.
	Foundations	A concrete foundation slab, strips or footings up to 16 m by 6 m and a levelling layer of aggregate with a maximum depth of 0.8 m, or a concrete plinth set onto the topsoil where non-ground penetrative works are required. The minimum Finished Floor Level (FFL) would be set to the design event flood level plus 0.3m freeboard or the credible maximum scenario flood level, whichever is greater. In the event voided structures are used, freeboard will be a minimum of 600 mm.
Disaggregated Conversion Units	Inverters	Maximum dimensions of 9 m by 6.5 m and a maximum height 3.5 m

Proposed Development component	Component type	Indicative component parameters
	Transformers	Maximum dimensions of 6.5 m by 5.5 m and a maximum height 3.5 m
	Switchgear	Maximum dimensions of 6.5 m by 2.5 m and a maximum height 3.5 m
	Material	The equipment would be finished to be in keeping with the prevailing surrounding environment, often with a grey painted finish.
	Foundations	A concrete foundation slab, strips or footings up to a metre greater than the maximum dimension of the relevant piece of equipment and a levelling layer of aggregate with a maximum depth of 0.8 m, or a concrete plinth set onto the topsoil where non-ground penetrative works are required. The minimum FFL would be set to the design event flood level plus 0.3m freeboard or the credible maximum scenario flood level, whichever is greater. In the event voided structures are used, freeboard will be a minimum of 600 mm.
Solar PV Sites Perimeter Fencing	Type	Deer wire mesh and wooden post security fence with wooden posts.
	Installation	Directly driven into the ground using a standard post driver. There would be no excavation of foundations. 'Concreting in' of posts would be used in limited circumstances such as corner or tension posts.
	Height	Maximum height of 2.5 m.
Security System	Type	A closed-circuit television (CCTV) camera system would be deployed around the perimeter of the operational areas of the Solar Development Sites.

Proposed Development component	Component type	Indicative component parameters
	Mounting	CCTV cameras would be mounted on posts with a maximum height of 3 m. The poles would be galvanized steel and painted in keeping with the prevailing surrounding environment, for example grey.
33 kV Switch room	Maximum dimensions	15 m by 5 m and a maximum height of 3.5 m. 3 m high palisade fencing around the Switch room. *Note: for the purposes of assessment within the ES the 33kV Switch rooms are considered to be interchangeable with the Conversion Units.
	Material	The 33 kV Switch room would be housed and externally finished to be in keeping with the prevailing surrounding environment, often with a grey painted finish.
	Foundations	A concrete foundation slab, strips or footings up to 16 m by 6 m and a levelling layer of aggregate with a maximum depth of 0.8 m, or a concrete plinth set onto the topsoil where non-ground penetrative works are required. Piling may be required due to ground conditions. The minimum Finished Floor Level (FFL) would be set to the design event flood level plus 0.3m freeboard or the credible maximum scenario flood level, whichever is greater. In the event voided structures are used, freeboard will be a minimum of 600 mm.
275 kV On-Site substations	Maximum compound area	1 ha for Solar Development Site 1 3.5 ha for Solar Development Site 2 3.5 ha for Solar Development Site 4
	Maximum height	13 m to the top of the busbars.
	Control building including switchgear	Maximum dimensions of 15 m by 32.5 m and maximum height of 4 m AGL.

Proposed Development component	Component type	Indicative component parameters
	33 kV Switchgear Building	Maximum dimensions of 7 m by 19 m and maximum height of 4.2 m (if below ground cable trenches not considered possible).
	Compound perimeter	3 m high palisade fencing around the compound. 2.5 m high deer type wire mesh and wooden post fencing outside of the palisade fencing.
	Foundations	Based on available information, a reasonable worst-case assessment of a 'raft' foundation of up to 2.5 m depth and up to 15 m depth for piles foundation has been assessed. The minimum FFL of all equipment including transformers and switchgear would be set to the design event flood level plus 0.3m freeboard or the credible maximum scenario flood level, whichever is greater. In the event voided structures are used, freeboard will be a minimum of 600 mm.
BESS Compound	Maximum compound area	10.5 ha.
	BESS Enclosures	Maximum dimensions 16 m by 3 m and maximum height of 3.5 m AGL per enclosure. The BESS enclosures will be externally finished to be in keeping with the prevailing surrounding environment. The exact colour will be subject to manufacturer specifications and agreed with the relevant planning authority prior to construction but will be carefully selected in subdued, non-reflective tones to sit as discreetly as possible within the landscape.
	Compound perimeter	3 m high palisade fencing around the compound with CCTV cameras installed.
	Foundations	The BESS Battery Enclosures would be mounted on concrete foundations (likely concrete base or monolith plinth up to 2 m deep 'raft' foundation and up to 15 m depth for piles

Proposed Development component	Component type	Indicative component parameters
		foundation), although other types of foundations such as compacted gravel, metal pile, or ground screw pile may be used depending on ground conditions. A worst case for each topic is therefore assumed for the assessment. The minimum FFL would be set to the design event flood level plus 0.3m freeboard or the credible maximum scenario flood level, whichever is greater. In the event voided structures are used, freeboard will be a minimum of 600 mm.
	BESS noise barrier	Up to 5m high. The exact colour will be subject to manufacturer specifications but will be carefully selected in subdued, non-reflective tones to sit as discreetly as possible within the landscape.
Access	BESS Compound and Substation Access (for Solar Development Sites 1, 2 and 4)	Maximum 6 m wide road (8 m at passing places) may be constructed of asphalt over a levelling layer of substrate and are therefore considered to be impermeable as a worst case assessment. The access points from the public highway and bends in the track would be wide enough to accommodate abnormal indivisible load turning space.
	Solar PV Access	A maximum of 3.5 m wide (6 m at passing places) constructed of a granular material and will therefore be permeable. The access points from the public highway may comprise reinforced concrete or asphalt.
	Parking	Parking bays will be provided at the substations and BESS Compound.
On-Site Cabling and Interconnecting Underground Cabling	Cable type	Cabling between the conversion units and sub-stations and between the Solar Development Sites would connect between 33 kV and 275 kV depending on the electrical design for the relevant part of the Proposed Development.

Proposed Development component	Component type	Indicative component parameters
	Indicative cable trench dimensions	As set out in Appendix 2.1: Cable Route Construction Method Statement **[EN0110012/APP/LVS/ 06.03.02.01]** the cable trench is up to approximately 7m in instances where multiple cables are running in parallel within the same trench. Trench depth would be up to 2 m subject to design and ground conditions. In some places trenchless techniques would be used. Trenchless solutions, for example horizontal directional drilling (HDD) is proposed for the crossing of the River Ouse, main rivers, IDB watercourses, and WER water body line watercourses (unless an existing culvert crossing can be utilised). Trenchless solutions will also be utilised when/if crossing ditches that lead to the following designated sites: Common Wood SINC, Nightingale Wood SINC, Burr Closes SSSI, and Barber Rain SINC. Trenchless solutions will also be employed to pass beneath Ouse Bank-Westfield-Ricall Ings SINC that flanks the river Ouse, which will avoid direct impacts to the designated site. Trenchless solutions would also be used for railway crossings. Road crossings will be a combination of trenchless and open cut crossings. When trenchless solutions are used the cable may be placed at greater depths. The Crossings Schedule **[EN110012/APP/LVS/07.01]** and Figure 2.5: Avoidance Areas [**EN0110012/APP/LVS/06.02.02.05**] illustrate the areas where trenchless crossings have been committed to.
	Indicative working width and haul road	The Proposed Development allows for necessary spatial flexibility in the routing of the Cables. The working area for installation of the Cables is generally anticipated to be a 25 m wide corridor. This may be slightly wider in places and narrower in others, for example to minimise removal of

Proposed Development component	Component type	Indicative component parameters
		hedgerows or at open cut watercourse crossings but will all lie within the Order Limits. Where watercourses cannot be avoided, a range of solutions will be considered including temporary culverts, with the type of crossing selected being determined based on on-site specific factors. The working width includes the trench, soil, and spoil storage, working area and a haul road with passing places where required. As is typical for cable installation projects, the haul road would be up to a maximum of 7 m wide. The majority of the haul road is expected to be constructed using granular / hard core. Where ground is identified as requiring additional protection e.g. launch and receptor pits aluminium trackway or similar protection may be used as an alternative to minimise ground disturbance. There may be additional requirement for the haul road in specific locations to have a wearing course applied to minimise degradation due to ground conditions and runoff for example. Where passing places are incorporated into the haul road these will be up to 12 m wide.
	Fencing	During construction the working width for the Cables would be demarcated by temporary fencing where required.
	Trenchless solution	Approximately 25 m x 25 m launch / receptor pit working area.
Grid Connection Cables	Cable Type	The Solar Development Sites and the Existing National Grid Monk Fryston Substation would be connected via a 275 kV circuit. A circuit is comprised of three buried cables.
	Indicative cable trench dimensions	As set out in Appendix 2.1: Cable Route Corridor Construction Method Statement **[EN0110012/APP/LVS/06.03.02.01]** the cable trench would be up to 2 m wide for

Proposed Development component	Component type	Indicative component parameters
		275 kV cables. Grid Connection Cables would be installed in a trench up to 2 m deep. In some places trenchless techniques would be used. This would be used for the crossing of the River Ouse, main rivers, IDB watercourses, and WER water body line watercourses. Trenchless solutions will also be utilised when/if crossing ditches that lead to the following designated sites: Common Wood SINC, Nightingale Wood SINC, Burr Closes SSSI, and Barber Rain SINC. Trenchless solutions will also be employed to pass beneath Ouse Bank-Westfield-Ricall Ings SINC that flanks the river Ouse, which will avoid direct impacts to the designated site. Trenchless solutions would also be used for railway crossings. Road crossings will be a combination of trenchless and open cut crossings. In these locations cable may be placed at greater depths.
	Indicative working width and haul road	The Cable Route Corridor will allow for necessary spatial flexibility in the routing of the Grid Connection Cables. The construction working area for installation of the Grid Connection Cables is generally anticipated to be up to a 25 m wide corridor. This may be wider in places to accommodate required operations (such as the crossing of utilities) and narrower in others, for example to minimise removal of hedgerows. Where watercourses cannot be avoided, a range of solutions will be considered including temporary culverts, with the type of crossing selected being determined based on on-site specific factors. The working width includes the trench, soil, and spoil storage, working area and haul road with passing places where required. As is typical for cable installation projects, the haul

Proposed Development component	Component type	Indicative component parameters
		road would be up to a maximum of 7 m wide and would be a surfaced haul road. The majority of the haul road is expected to be constructed using granular/hard core. Where ground is identified as requiring additional protection e.g. launch and receptor pits aluminium trackway may be used as an alternative to minimise ground disturbance. There may be additional requirement for the haul road in specific locations to have a wearing course applied to minimise degradation due to ground conditions and runoff for example. Where passing places are incorporated into the haul road these will be up to 12 m wide.
	Fencing	The working width of the Grid Connection Corridor would be demarcated by temporary fencing where required.
	Trenchless solution	Approximately 25m x 25m launch / receptor pit working area.
Existing National Grid Substation	Point of connection	The Grid Connection Cables would connect to the national grid at the Existing National Grid Monk Fryston 275 kV Substation. Works include populating the bay onto the existing Buss bars within the substation and associated connection works.

Scoping Opinion

2.4.21 An EIA Scoping Report (Appendix 1.1 (ES Volume 3) [**EN0110012/APP/LVS/06.03.01.01**]) was submitted to PINS on 11 November 2024. The EIA Scoping Opinion was issued by PINS on 19 December 2024 (Appendix 1.2 (ES Volume 3) [**EN0110012/APP/LVS/06.03.01.02**]). A summary of key comments related to the description of the Proposed Development is presented in Table 2-2 below.

Table 2-2 Description of the Proposed Development - Scoping Opinion Comments

Scoping opinion I.D	Scoping opinion comment	How is this addressed
The Inspectorate [ID 2.0.1]	The Inspectorate expects that at the point an application is made, the description of the Proposed Development will be sufficiently detailed. Where flexibility is sought, the ES should clearly set out and justify the maximum design parameters that would apply for each option assessed.	A detailed description of the Proposed Development is provided within this Chapter. Design parameters are detailed within Table 2-1, with maximum parameters for the detailed design provided within the Design Parameters and Commitments document [**EN0110012/APP/LVS/05.06**] submitted as part of the DCO Application.
The Inspectorate [ID 2.0.2]	The Inspectorate recommends that the decision between the two options for the proposed panels: static or tracked, should be made prior to submission of the DCO application. If this is not possible, the ES should identify and assess the worst case scenario for applicable topics (Landscape and Visual, Cultural Heritage, Glint and Glare, Noise and Vibration) during operation.	A decision between the two options for the proposed panels has not been made prior to submission of the DCO application. As such, all relevant topic chapters have identified and assessed the worst case scenario for proposed panel type. See Chapters 5 to 16 (ES Volume 1) [**EN0110012/APP/LVS/06.01**]
The Inspectorate [ID 2.0.3]	Where technical terminology is used, the ES should provide a clear summary for the benefit of a non-technical audience.	A glossary and abbreviations document is provided as part of this ES. See the Contents, Glossary and Abbreviations document [**EN0110012/APP/LVS/06.01.00**]. The ES is summarised using non-technical language in the Non Technical Summary

Scoping opinion I.D	Scoping opinion comment	How is this addressed
		[EN0110012/APP/LVS/06.04.01].
The Inspectorate [ID 2.0.4]	Based on the absence of site-specific data and methodology around determining pile design depths, the ES should identify how these depths have been determined, and how the potential data limitation of an absence of site-specific survey has been considered within the assessments within the ES, and demonstration that a worst case has been assessed.	The Design Parameters and Commitments document [**EN0110012/APP/LVS/05.06**] submitted as part of the DCO Application identifies maximum foundation depths and outlines how these depths have been determined.
The Inspectorate [ID 2.0.5]	The ES should confirm the appropriate buffers to be employed and demonstrate that they are secured through the site layout and/or relevant management plans.	Chapters 5 to 16 (ES Volume 1) [**EN0110012/APP/LVS/06.01**] detail the appropriate buffers required where relevant. All such buffers are incorporated into the Order Limits and secured through the limits of deviation on the Works Plans, [**EN110012/APP/LVS/02.03**] and the Design Parameters and Commitments document **[EN0110012/APP/LVS/05.06]** submitted as part of the DCO Application.
The Inspectorate [ID 2.0.6]	The ES should describe the proposed site entrance/s and the routes to be used for all vehicular access during construction and operation of the Proposed Development and this information should be clearly presented on supporting plans within the ES. The ES should describe and assess the potential impacts associated with any improvements/ changes to the access routes. The ES should explain how the proposed access route(s) relate to sensitive receptors.	Section 2.5 of this Chapter provides information relating to the Site Access points for both access to the Solar Development Sites and Cable Route Corridor and potential routes to be used. The Outline Construction Traffic Management Plan (oCTMP) [**EN0110012/APP/LVS/07.12**] sets out how the Construction Traffic for the Proposed Development will be managed. See Chapter 14: Traffic and Movement (ES Volume 1)

Scoping opinion I.D	Scoping opinion comment	How is this addressed
		[**EN0110012/APP/LVS/06.01.14**] for further information relating to impacts relating to construction traffic and access.
The Inspectorate [ID 2.0.7]	The ES should provide details regarding the number, location and dimensions of all construction compounds and access routes. Indicative timescales should be provided for all temporary works. The Applicant should make effort to locate the compounds where existing access to the construction site is available to reduce the need for new accesses and the resultant impacts.	Section 2.7 of this Chapter provides details of the construction compounds and the locations of these are shown on the Works Plans [**EN110012/APP/LVS/02.03**]. Section 2.5 of this Chapter provides information relating to the Site Access points. See Table 2-6 which outlines the indicative construction programme.
The Inspectorate [ID 2.0.8]	The ES should quantify the number of construction workers required and explain, with reference to relevant thresholds, whether this is likely to result in significant traffic effects.	Paragraph 2.7.17 of this Chapter provides details on the number of construction workers for the Proposed Development. Chapter 14: Traffic and Movement (ES Volume 1) [**EN0110012/APP/LVS/06.01.14**] provides an assessment of traffic effects related to construction worker numbers.

2.5 Components of the Proposed Development

2.5.1 Table 2-1 above describes the design parameters of the Proposed Development. Further detail of the role and function of the Proposed Development components are presented below.

Solar PV Infrastructure

Solar PV Panels

2.5.2 The Solar PV Panels would convert sunlight into electrical current (as direct current (DC)). The Solar PV Panels would be bifacial which are designed to let some light through and have a transparent backing. The solar cells of bifacial panels are also able to absorb energy from the rear of the cell and any reflected light to increase energy production compared to monofacial panels.

2.5.3 Various factors (such as electrical design) inform the number and arrangement of Solar PV Panels in each Solar PV Table. Flexibility is required to accommodate future technology developments at the detailed design stage, as referenced above.

2.5.4 The Applicant does not propose a limit on the generating capacity of the Proposed Development in the DCO Application as the environmental effects associated with the Proposed Development are determined by the relevant design parameters and not capacity.

Solar PV Mounting Structures

2.5.5 Each Solar PV Panel would be mounted on a metal rack, known as a Solar PV Mounting Structure. The most common installation solution on existing UK solar farms is to drive the piles directly into the ground without the need for the excavation for foundations and avoiding disturbance to the surrounding land surface. This installation method will be used other than in areas where archaeological protection is required, where concrete feet or other non-ground penetrative techniques will be used to secure the Mounting Structures. Figure 2.6: Concrete Feet Locations or other non-ground penetrative techniques [**EN0110012/APP/LVS/06.02.02.06**] shows the locations where concrete feet or other non-ground penetrative techniques will be used. The exact locations of where archaeological protection is required will be confirmed in the detailed CEMP to be produced at detailed design stage (as outlined within the oCEMP **[EN0110012/APP/LVS/07.02]**).

2.5.6 The Proposed Development would utilise either east-west single axis tracker Solar PV Mounting Tables (Option A) or fixed south facing Solar PV Mounting Tables (Option B) and seeks consent for both.

2.5.7 For the purposes of assessment, each assessment topic has assessed either Option A or Option B depending on what the worst case scenario is for that assessment. See Chapters 5 to 16 (ES Volume 1) **[EN0110012/APP/LVS/06.01]**.

Tracking Solar PV Tables (Option A)

2.5.8 A tracker system involves attaching the Solar PV Panels to a motorised table that can move in relation to the sun. This allows for optimal power generation throughout the day. The Solar PV Panels would be positioned horizontally overnight. In this option, the Proposed Development would utilise a single-axis tracker system which tilts the Solar PV Panels around a horizontal north-south axis, thus tracking the movement of the sun from east to west, as illustrated in Plate 2-1 to Plate 2-3.

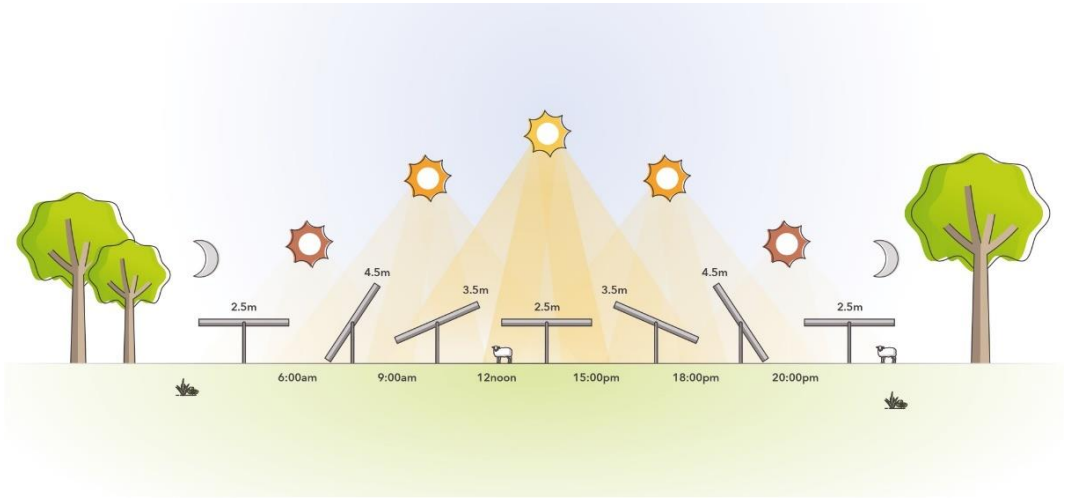
2.5.9 The Applicant has determined that east-west single axis tracker Solar PV Panels are the most efficient and would be utilised within the Solar Development Sites, unless there are practical or environmental constraints. This is due to ongoing technological advances and environmental and economic considerations. For example, recent studies by the Solar Energy Research Institute using world-wide data (Ref 4) found single axis tracker systems significantly outperform fixed tilt configurations in terms of energy output, and that using single axis tracker systems with bifacial panels can produce 35% more energy than fixed tilt monofacial panels. Single axis trackers also have the benefit of being lower in height for most of the day compared to the fixed south facing arrangement.

2.5.10 The 4.5 m tracker panel maximum envelope has been sought to provide better solar generation throughout the day, across different seasons, especially in the early morning and late afternoon. This leads to improved generation efficiency, delivering more energy from the same land footprint per MW than a 3.5 m envelope and other solar technologies.

Plate 2-1 Typical Tracker Solar PV Panels in an Angled Orientation

Plate 2-2 Typical Tracker Solar PV Panels in a Near Flat Orientation

Plate 2-3 Illustration Tracker Solar PV Panels following the sun's positions



2.5.11 Tracker panels can include two rows of panels (2P) or one row of panels (1P). 1P are less efficient at converting sunlight into electrical current and provide a lower ground cover ratio. 1P are up to 3.5 m in height and do not require as much support from their foundations. Therefore, 1P would be used where concrete feet (refer to Plate 2-5) or other non-ground penetrative techniques are identified as being required to mitigate impacts to buried archaeology. Refer to Appendix 2.2: Indicative Engineering Drawings and Sections (ES Volume 3) [**EN0110012/APP/LVS/06.03.02.02**] for a diagram of 1P panels with concrete feet. Each environmental discipline chapter defines the worst case scenario for the purposes of assessment (refer to Chapter 4: Approach to EIA (ES Volume 1) [**EN0110012/APP/LVS/06.01.04**]).

Fixed Solar PV Tables (Option B)

2.5.12 Fixed south facing Solar PV Panels are the most common approach for ground mounted solar PV facilities in the UK to date and involve installing Solar PV Panels to fixed tables, arranged in rows facing south. An example of fixed south facing arrangement is presented in Plate 2-4.

2.5.13 Fixed south facing Solar PV Panels may be utilised across each Solar Development Site or at an individual field level where practical and/or environmental constraints prevent the use of Tracking Solar PV Tables. Each relevant topic chapter of the ES analyses the worst case panel type for the specific topic.

2.5.14 As for Option A, concrete feet (see Plate 2-5), or other non-ground penetrative techniques, may be used as archaeological mitigation to secure the mounting structures to the ground. The use and implementation of concrete feet is considered in the Archaeological Mitigation Strategy [**EN0110012/APP/LVS/07.11**].

Plate 2-4 Typical Fixed Solar PV Panels (with Disaggregated Conversion Unit)

Plate 2-5 Fixed Panels on Concrete Feet

Conversion Units

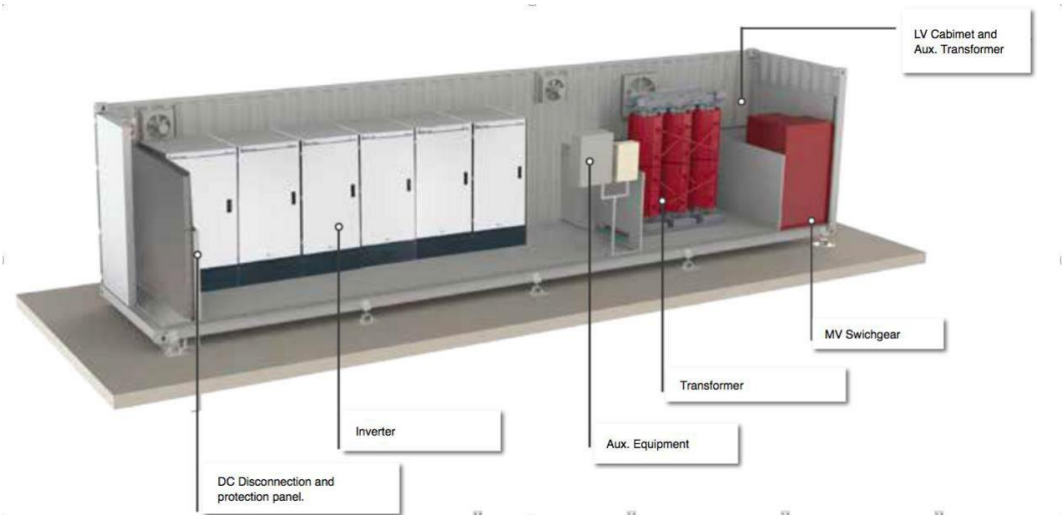
2.5.15 The Conversion Units incorporate the inverters, transformers and switchgear and are required to manage the electricity generated by the Solar PV Panels. These would either be standalone equipment ('Disaggregated'), or they would be housed ('Integrated') together with a container. Indicative locations for these Conversion Units are shown in Figure 2.1 Illustrative Site Layout Plan (ES Volume 2) [**EN0110012/APP/LVS/06.02.02.01**] but these locations are not fixed. How this is considered in the assessment is set out in the relevant topic chapters.

For the purposes of assessment within this ES the 33kV Switch rooms described in the following section below are assumed to be interchangeable with the Conversion Units.

2.5.16 Inverters are required to convert the DC electricity collected by the Solar PV Panels 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 AC electricity generated by the Solar PV Panels before it reaches the Substations. Switchgear is the combination of electrical disconnect switches, fuses or circuit breakers used to control, protect and isolate electrical equipment. Switchgear is used both to de-energise equipment to allow maintenance work to be done and to clear faults.

2.5.17 An Integrated Conversion Unit would comprise one or two central inverters, transformers and switchgear all housed within a complete, preassembled and preconfigured unit. Monitoring and control systems would consist of manual controls at the Conversion Units, and automatic and centralised monitoring and control features at the control rooms on the onsite substations. Plate 2-6 provides an illustration of a typical integrated Conversion Unit.

Plate 2-6 Typical Integrated Conversion Unit



2.5.18 Standalone inverters, transformers and switchgear collectively making up a Conversion Unit may also be implemented individually. Plate 2-7 provides an illustration of a typical Disaggregated layout.

Plate 2-7 Typical Standalone Equipment Making Up a Conversion Unit

2.5.19 Both Integrated and Disaggregated options would sit on a concrete foundation slab, strips or footings for each of the units and a levelling layer of aggregate; or a concrete plinth set atop the topsoil where non-ground-penetrative works are required. Figure 2.6: Concrete Feet Locations or other non-ground penetrative techniques [**EN0110012/APP/LVS/06.02.02.06**] shows the locations where concrete feet or other non-ground penetrative techniques will be used

33 kV Switch rooms

2.5.20 The 33 kV Switch rooms would consist of electrical infrastructure such as switchgear and metering equipment. The electrical infrastructure would be contained within a building as set out within Table 2-1.

2.5.21 The 33 kV Switch rooms would be similar in appearance to the Integrated Conversion Units and would be contained within the same design parameters (see Table 2-1). As outlined above, for the purposes of assessment within this ES the 33 kV Switch rooms are assumed to be interchangeable with the Conversion Units. Indicative locations of the 33kV Switch rooms are shown in Figure 2.1 Illustrative Site Layout Plan (ES Volume 2) **[EN0110012/APP/LVS/06.02.02.01]** but these locations are not fixed. How this is considered in the assessment is set out in the relevant topic chapters.

2.5.22 A typical 33 kV Switch room is shown below in Plate 2-8.

Plate 2-8 Typical 33kV Switch room

Spare parts storage buildings

2.5.23 Spare parts may be stored in a specific container like storage building. These would include the same parameters as set out within Table 2-1 (15 m by 5 m and a maximum height of 3.5 m) for the Integrated Conversion Units and 33kV Switch rooms and are therefore assesses as being interchangeable.

Battery Energy Storage System (BESS)

2.5.24 The Proposed Development will include a Battery Energy Storage System (BESS) within Solar Development Site 2 (referred to as the 'BESS Compound') (refer to ES Volume 2, Figure 2.1: Illustrative Site Layout Plans **[EN0110012/APP/LVS/06.02.02.01]**. The BESS will be designed to provide peak generation and grid balancing services to the electricity grid. The BESS would allow excess electricity generated from the Solar PV Panels and/or excess energy in the grid to be stored in the batteries and exported at strategic times of the day to provide flexibility and enhance grid reliability.

2.5.25 Plate 2-9 shows an example image of a BESS arrangement with associated infrastructure.

Plate 2-9 Typical Battery Energy Storage System

2.5.26 The batteries would be housed within enclosures (referred to as 'BESS Enclosures' within this ES). The BESS Enclosures would be mounted on concrete foundations, although other types of foundations such as compacted gravel, metal pile, or ground screw pile may be used depending on ground conditions. A bunded impermeable surface or other form of containment system would be used to manage surface water drainage.

2.5.27 It is anticipated that approximately 540 BESS Enclosures, and associated infrastructure would be located within a single BESS Compound up to an approximate area of 10.5 ha. The number of BESS has increased since PEIR to allow for degradation of the batteries and ensure a four hour system duration is maintained. For the purposes of assessment the assumption of 540 BESS Enclosures has been used however the final number of enclosures will be dependent on technology evolution before the final design is confirmed. The BESS Enclosures will have maximum dimensions of 16 m by 3 m and a maximum height of 3.5 m agl. Final BESS design and site layout will have been validated through mandatory Large Scale Fire Testing (LSFT) stipulated in National Fire Protection Association (NFPA) 855 (2026) and rigorous consequence modelling to minimise the requirement for any firefighter intervention in a thermal runaway incident. LSFT would establish minimum equipment spacing distances that demonstrate there is no fire propagation to adjacent BESS. The precise number of BESS Enclosures will depend upon the level of power capacity of energy storage that the Proposed Development will require. Regardless, the BESS Compound will not exceed the maximum compound area defined in Table 2-1.

2.5.28 The BESS Compound would be surrounded by a 3 m high metal palisade fence with CCTV. Transformers and dedicated switchgears will also be required to connect cables to and from the batteries.

2.5.29 Heating, ventilation and air conditioning (HVAC) systems will be required to ensure the efficiency of the batteries, which are integrated into the BESS Enclosures. This may involve a HVAC system that is external to the BESS Enclosures located either on the top or attached to the side. If this uses air to heat and cool it will have a fan built into it that is powered by auxiliary power.

2.5.30 Similar to the Solar PV Panels, the BESS Enclosures would be connected to inverters, transformers and switchgear which may be integrated into a single container or as standalone components. The maximum parameters for the inverters, and transformers and switchgear would be the same as those associated with the Solar PV Panels located within the main battery energy storage system compound as outlined in Table 2-1.

2.5.31 Cabling between BESS Enclosures and other infrastructure within the BESS Compound will either be above ground in cable trays or laid in a trench up to 1.2 m in depth and 1.6 m wide.

2.5.32 The BESS design will include integrated fire and explosion prevention and protection systems following National Fire Chiefs Council guidance (NFCC) and key industry safety standards i.e. NFPA 855 (Ref 5), NFPA 69 (Ref 6), UL 9540 (Ref 7), BS EN IEC 62933-5-2 (Ref 8), and based on comprehensive UL 9540A (2025, 5th Edition) (Ref 9) testing. The selected BESS as mandated under NFPA 855 (2026 Revision) will have undertaken Large Scale Fire Testing (LSFT) as part of UL 9540A tests and / or 3rd party full scale destruction testing. This testing involves burning the full BESS system to validate minimum safe equipment spacing distances and performance test active and passive mitigation systems integrated into the BESS design. NFPA 855 (2023) (Ref 5) confirms that water is the most effective battery fire suppression agent, therefore a dedicated water-based suppression system may be provided within each BESS Enclosure designed to control or fully suppress a fire, without the intervention of Fire Fighters. A water storage facility for the purposes of firefighting water supply will be included. The suppression system would be capable to operate effectively in conjunction with a gas exhaust / ventilation system to minimise deflagration risks. The bunded impermeable surface or other form of containment system and associated infrastructure will be used to contain used firewater. Full details of the Applicant's safety commitments and testing requirements are confirmed in the Outline Battery Safety Management Plan (oBSMP) [**EN0110012/APP/LVS/7.06**].

2.5.33 Other fire safety measures include spacing requirements between the BESS Enclosures and between the BESS Compound and other infrastructure has also been included within the oBSMP **[EN0110012/APP/LVS/07.06]**. Provision would also be made for fire water containment, which is considered further in Chapter 15: Water Resources and Flood Risk (ES Volume 1) [**EN0110012/APP/LVS/06.01.15**].

275kV Sub-stations

2.5.34 The Proposed Development requires substations on Solar Development Sites 1, 2 and 4, to export the generated electricity onwards to the National Grid at the 275 kV Monk Fryston Substation.

2.5.35 It is possible that a range of foundation solutions may be required depending on the specific ground conditions. Based on available information, a reasonable worst-case assessment of a 'raft' foundation of up to 2.5 m depth and up to 15 m depth for piled foundations has been assessed.

2.5.36 Parking bays will be provided at each substation.

2.5.37 The Substations would be up to 275 kV and would consist of electrical infrastructure such as transformers, switchgear and metering equipment. The Substations would be connected to the 33 kV Switch Rooms via the Interconnecting Cables and step up the voltage to 275 kV ready to be exported to the Existing National Grid Monk Fryston Substation via the Grid Connection Cables.

2.5.38 275 kV Substations would also step down the voltage from 275 kV to 33 kV. This would allow for both excess electricity provided from the grid at 275 kV and provided from the Solar Development Sites at 33 kV to be stored within the BESS.

2.5.39 The electrical infrastructure would be outside (i.e. not contained within a building) and would comprise separate infrastructure and conductors. The 275 kV Substations would have a separate Control Building (with welfare facilities) and may incorporate a metering room, though this may instead be a smaller separate structure.

2.5.40 Equipment typical of a 275 kV on-site substation is shown in Plate 2-10.

Plate 2-10 Example of equipment at a typical 275 kV on-site substation.

Grid connection works at Monk Fryston Substation

2.5.41 Work will be undertaken by the Applicant or National Grid within the Existing National Grid Monk Fryston 275kV Substation including the population of the bay onto the existing busbars. The work consists of installation of:

7) A 275 kV 3-phase 400A circuit breaker for control and protection of the outgoing circuit servicing the Proposed Development;
8) A 3-phase High Accuracy Metering Current and Voltage Transformer assembly for commercial metering of the connection;
9) A 3-phase 275 kV Line disconnector/earth switch for isolation and earthing of the outgoing 275 kV feeder circuit;
10) A 3-phase set of 275 kV high voltage cable sealing ends and cables connecting the Existing National Grid Monk Fryston Substation with the Proposed Development; and
11) A 3-phase Power Quality ready Capacitor Voltage transformer.

2.5.42 Also required is protection, control and ancillary apparatus for the circuit to be housed within a stand-alone building sized approximately 6 m x 3 m, comprising duplicate feeder protection systems, commercial metering systems, National Grid owned protection and control equipment and User Remote Control and data acquisition apparatus.

2.5.43 At this stage the location of the bay to be used by the Proposed Development within the Existing National Grid Monk Fryston Substation is likely to be in the north west of the existing Substation, but this ES assumes the connection could be at any location within the Substation boundary.

Cabling

On-site underground cabling

2.5.44 Cabling from the solar PV modules to the Conversion Units would be fixed to the mounting structure of the modules, with a small section placed underground where it leaves the solar PV modules and connects to the conversion units.

2.5.45 Additional low voltage auxiliary cabling would supply the CCTV and monitoring equipment.

2.5.46 The On-site Cabling could be located anywhere within the Solar Development Sites depending on location of equipment in the final design.

Interconnecting Cables

2.5.47 Interconnecting Cables between the Conversion Units and Substations and between the Solar Development Sites would connect between 33kV and 275kV depending on the electrical design.

Grid Connection Cables

2.5.48 The electricity generated by the Solar PV Panels and / or intended to be stored by the BESS would be exported from the BESS and Solar Development Sites to the Existing National Grid Monk Fryston Substation via underground Grid Connection Cables routes within the Cable Route Corridor. The voltage of the Grid Connection Cables would be 275 kV.

Cable Route Corridor

2.5.49 The exact location of the Grid Connection Cables and Interconnecting Cables within the Cable Route Corridor will be determined at the detailed design stage. For assessment purposes, the placing of the cable anywhere within the Cable Route Corridor has been considered. The Cable Route Corridor is typically 50 m wide, but in a number of locations such as utility or road and rail crossings, it widens up to 450 m wide, noting the typical construction working width is typically 25 m wide (see below). The final cable route will be microsited with the Cable Route Corridor to seek to avoid impacts on archaeological features pursuant to the commitments in the Archaeological Mitigation Strategy **[EN0110012/APP/LVS/07.11]** and important ecological features and fauna as identified during the pre-construction UK Habitat surveys and species surveys carried out pursuant to the oCEMP **[EN0110012/APP/LVS/07.02]**, and taking account of the buffer zones to ecological receptors set out in Chapter 6 [**EN0110012/APP/LVS/06.01.06**] and the Design Parameters and Commitments Document **[EN0110012/APP/LVS/05.06]**, as far as possible. The cable will also

be microsited to pass through existing gaps in hedgerows/ditches wherever practicable, as set out in the Design Parameters and Commitments Document **[EN0110012/APP/LVS/05.06]**.

2.5.50 Depending on the detailed electrical design the Interconnecting Cables from Solar Development Site 1 may be routed directly to Solar Development Site 4 (CRC 1-4) or via Solar Development Site 2 CRC 1-4a). Both of these options have been assessed in Chapters 5 to Chapter 16 (ES Volume 1) [**EN0110012/APP/LVS/06.01**].

2.5.51 The voltage of the Interconnecting Cables and the number of circuits would affect the width and number of cable trenches required.

2.5.52 The width and spacing of the cable trenches will also vary depending on environmental constraints, engineering requirements, or if crossing third party apparatus (e.g. railway lines). Crossings would be carried out via a combination of open cut trenching and trenchless solutions, with the latter used if needed to avoid and reduce adverse environmental effects. As a reasonable worst case scenario, for the purposes of assessment, Horizontal Directional Drilling (HDD) has been assumed as the trenchless solution.

2.5.53 A number of Avoidance Areas have been identified (refer to ES Volume 2, Figure 2.5 [**EN0110012/APP/LVS/06.02.02.05**] and Appendix 2.1: Cable Route Construction Method Statement (ES Volume 3) [**EN0110012/APP/LVS/06.03.02.01**] where non-intrusive (trenchless) installation methods will be used to avoid impact to sensitive features such as watercourses, hedgerows and mature vegetation. Other crossings will be via trenchless solutions or open cut depending on the detailed design, however, for the purposes of the ES, open cut has been assumed. The detailed CEMP will confirm the crossing technique that is proposed for the non-Avoidance Areas and confirm that no materially new or materially different effects to those reported in the ES will arise from the chosen technology. To demonstrate that such a test is likely to be able to be passed if trenchless (in this case HDD) techniques were to be used in these areas, the ES has, as a sensitivity, considered a number of non-Avoidance Area locations with HDD technology being utilised and reported on the effects that would arise if that was the chosen technology. These locations are shown on Figure 2.8: HDD Sensitivity Testing **[EN0110012/APP/LVS/06.02.02.08]**.

2.5.54 Data cables will be installed alongside electrical cables in the trenches in order to allow for monitoring during operation, such as the collection of solar data from pyranometers and inverters.

2.5.55 Further information on cable installation (including in respect of joint bays) is set out in Appendix 2.1: Cable Route Construction Method Statement [**EN0110012/APP/LVS/06.03.02.01**].

Cabling Layout

Table 2-3 Cabling Types

Cabling Route	Cable type
Solar Development Site 1 to Solar Development Site 4	1 x up to 275 kV circuit
Solar Development Site 1 to Solar Development Site 4/Site 2	1 x up to 275 kV circuit
Solar Development Site 2 to Solar Development Site 4	2 x up to 275 kV or 9 x 33 kV plus 1 x up to 275 kV
Solar Development Site 3 to Solar Development Site 4	1 x 33 kV circuit
Solar Development Site 2 to Solar Development Site 6	4 x 33 kV circuit
Solar Development Site 2 to Solar Development Site 8	3 x 33 kV circuit
Solar Development Site 6 to Solar Development Site 7	1 x 33 kV circuit
Solar Development Site 4 to Monk Fryston Substation	1 x 275 kV circuit

Distribution Network Operator Connections

2.5.56 It is envisaged that local grid connections to the distribution network (operated by Northern Power Grid) will be made for all substations, where practicable.

2.5.57 This will allow the generating station to connect to the local grid network to obtain short-term auxiliary power to the substations to maintain operation in the event that there is a technical problem with the connection to the National Grid.

2.5.58 Where connections to the local grid network are not practicable the substations will be equipped with a backup diesel generator. This generator is intended to operate in the event of a grid connection failure (power outage). It will also maintain communication and protection systems to ensure a safe restart when power is restored.

2.5.59 Reinstating grid connection after a failure can be challenging and complex as a power supply is required for the maintenance of a stable frequency and voltage levels, as well as the coordination of multiple power sources. Diesel generators provide immediate power to essential systems, including communication and protection systems, which are vital for coordinating the restart process. Generators are reliable and can operate independently of the grid and while BESS can store and discharge energy, BESS may not always have sufficient capacity to handle prolonged outages or the initial surge in demand during a restart. Diesel generators supplement BESS to ensure continuous power supply and maintain critical infrastructure, facilitating a smoother and safer restart.

Other infrastructure

Internal access tracks

2.5.60 Access to the Proposed Development will be required for construction, operation and decommissioning. A series of access tracks will be included within the Solar Development Sites and accesses provided onto the local highway network. Existing access tracks will be used where practicable. Access track parameters are set out within Table 2-1.

2.5.61 The access tracks shown on Figure 2.1: Illustrative Site Layout Plan (ES Volume 2) [**EN0110012/APP/LVS/06.02.02.01**] are indicative locations and so do not form the basis of assessment. The locations and alignments of the internal access tracks within the Solar Development Sites may change depending on the final layout design and the construction methodology but are controlled by the parameters set out in Table 2-1 and measures set out in the oCEMP [**EN0110012/APP/LVS/07.02**] and oOEMP [**EN0110012/APP/LVS/07.03**].

Solar PV Sites perimeter fencing

2.5.62 A perimeter security fence would be installed to enclose the operational areas of the Proposed Development. Fencing would be deer wire mesh and wooden post fencing with a maximum height of 2.5 m as illustrated in Plate 2-11. The fence would be designed in such a way to allow small animals to pass through the Solar Development Areas within the Solar Development Sites and would also be gated to allow access to and from the Proposed Development.

Plate 2-11 Typical Deer Fencing

Security system and lighting

2.5.63 Pole-mounted CCTV comprising infra-red security detection cameras would be mounted on poles of up to 3 m in height located within the perimeter fence. It is

anticipated that these cameras would have motion detection technology for recording unauthorised access and would be monitored remotely. They would point directly within the Site boundary and away from land outside.

2.5.64 In general, it is anticipated that the Proposed Development would not be lit. The exception would be at the BESS and substations, where movement sensor-triggered lighting will be needed for security/safety reasons. The substations would generally not be occupied by personnel overnight, so the lighting would not be on continuously.

Drainage

2.5.65 The detailed operational drainage design for the Proposed Development will be developed after development consent is granted but prior to construction in substantial accordance with the Outline Drainage Strategy submitted with the Application **[EN0110012/APP/LVS/06.03.15.04]**. The overarching principle of the drainage strategy for the Proposed Development is to provide sustainable drainage solutions (SuDS) at source, ensuring that surface water run-off is managed appropriately.

Site Access

2.5.66 Wherever practicable, existing field accesses have been utilised for access to the Order Limits. Where a suitable field access does not exist new accesses would be constructed. If required, accesses will be designed to minimise effects on hedgerow and trees, however, there may be localised removal of sections of hedgerows and other trees as required, e.g. for visibility splays.

2.5.67 The access points into the individual Solar Development Sites have been designed to accommodate articulated heavy goods vehicles (HGV) with a maximum length of 16.5 m. Visibility splays have been included and based on the recorded speed of the vehicles on the road network (85th percentile speeds) to ensure safety. There may be some variation on visibility splays based on site specific conditions.

2.5.68 A number of deliveries within the Order Limits during the construction phase would be Abnormal Indivisible Loads (AILs). An AIL is where the vehicle exceeds 44 tonnes, the width is over 2.9 m or the length is more than 18.65 m. These are likely to include deliveries of EHV transformers and cable drums. A separate standalone AIL assessment has been undertaken as part of the DCO application and is appended to the Outline Construction Traffic Management Plan (oCTMP) [**EN0110012/APP/LVS/07.12**]. Where AIL access is required the access points have been designed to allow AIL access.

Solar Development Site Accesses

2.5.69 The access locations comprise those set out in Table 2-5.

Table 2-4 Solar Development Site Access Points

Access	Description	Construction Phase	Operation Phase	Decom. Phase
SDS 1, Access 1	Solar Development Site 1 – access point from Wheldrake Lane (existing access point)	✓	✓	✓
SDS 1, Access 2	Solar Development Site 1 – access point from Skipwith Lane (existing access point)	✓	✓	✓
SDS2, Access 1	Solar Development Site 2 – directly from the A63 via an existing agricultural access (existing access point)	✓	✓	✓
SDS2, Access 2	Solar Development Site 2 – a new access point from the southern section of Site 2 will allow vehicles to cross Fryston Common Lane directly into the northern section of Site 2 (existing access point) which will ensure standard traffic does not access the northern section of Site along Fryston Common Lane. Fryston Common Lane may be used for emergency access purposes.	✓	✓	✓
SDS2, Emergency access	Solar Development Site 2 –access point to the south-west of the site from the A63 (existing access point). This access point would only be used for emergency purposes and not for standard construction or operation traffic.	✓ - may be used for the delivery of transformers only	✓ - for emergency purposes only	
SDS3, Access 1	Solar Development Site 3 – access point from Hillam Common Lane (existing access point).	✓	✓	✓
SDS4, Access 1	Solar Development Site 4 – third access point from Roe Lane into the north western field boundary (existing access point)	✓	✓	✓
SDS4, Access 2	Solar Development Site 4 – access point from Roe Lane into the field on the east side of the road (existing access point)	✓	✓	✓
SDS4, Access 3	Solar Development Site 4 – second access point from Roe Lane into the field on the west side of the road (existing access point)	✓	✓	✓

Access	Description	Construction Phase	Operation Phase	Decom. Phase
SDS4, Access 4	Solar Development Site 4 – new access point from Haddlesey Road	✓	✓	✓
SDS6, Access 1	Solar Development Site 6 – two access point from Common Lane (existing access points)	✓	✓	✓
SDS6, Access 2	Solar Development Site 6 – second pair of access points from Common Lane (existing access points)	✓	✓	✓
SDS7, Access 1	Solar Development Site 7 – access point from Common Lane (existing access point)	✓	✓	✓
SDS8, Access 1	Solar Development Site 8 – access point from Phillip Lane Level Crossing (existing access point). Whilst Network Rail has indicated that this may be acceptable, the Applicant is conscious that the railway is a live operational asset and that circumstances at the time of construction (such as railway works) may mean that access will not be able to be taken when it is needed. The Order Limits therefore allow for alternative accesses into Solar Development Site 8 to ensure that access can be taken at all times, including by avoiding crossing the railway if necessary.	✓	✓	✓
SDS8, Access 2	Solar Development Site 8 – access point from the south via Scalm Lane Level Crossing (existing access point). As with the Phillip Lane access, the railway is a live operational asset and that circumstances at the time of construction (such as railway works) may mean that this access will not be able to be taken when it is needed. The Order limits therefore allow for alternative accesses into Site 8 to ensure that access can be taken at all times, including by avoiding crossing the railway if necessary.	✓	✓	✓
SDS8, Access 3	Solar Development Site 8 – to avoid the railways an alternative new access point from the north via Scalm Lane	✓	✓	✓

Access	Description	Construction Phase	Operation Phase	Decom. Phase
	could be achieved (new temporary access track created).			

2.5.70 The access into Solar Development Site 2 (SDS2, Access 1) will also provide access into the BESS and the substation. This access will be suitable for AILs. The access point from the public highway and bends in the track would be wider to accommodate abnormal indivisible loads turning space. AIL access routes to the Order Limits are considered in Chapter 14: Traffic and Movement (ES Volume 1) [**EN0110012/APP/LVS/06.01.14**].

2.5.71 There are three access options for Solar Development Site 8 being considered (and assessed within the Application) as set out in Table 2-4 above. Further information on these three options is available within Chapter 14: Traffic and Movement **[EN0110012/APP/LVS/06.01.14]**.

Cable Route Corridor Accesses

2.5.72 The access locations for construction of the Cable Route Corridor are set out in Table 2-6:

Table 2-5 Cable Route Access Points

Access	Description	Cable Corridor No.	Construction Phase	Operational Phase
CA1	South of Skipwith Road (existing access point)	CRC 1-4	✓	
CA2	West of Skipwith Road (existing access point)	CRC 1-4	✓	
CA3	West of Skipwith Road (existing access point)	CRC 1-4	✓	✓
CA4	Glade Road (existing access point)	CRC 1-4	✓	✓
CA5	North of King Rudding Lane (existing access point)	CRC 1-4	✓	
CA6	South of King Rudding Lane (new access point)	CRC 1-4	✓	
CA7	South of Main Street onto Checker Lane (existing access point)	CRC 1-4	✓	✓

Access	Description	Cable Corridor No.	Construction Phase	Operational Phase
CA8	Lordship Lane (existing access point)	CRC 1-4	✓	
CA9	North of Black Fen Lane (new access point)	CRC 1-4	✓	
CA10	West of Black Fen Lane (existing access point)	CRC 1-4	✓	✓
CA11	East of Wistow Road (new access point)	CRC 1-4	✓	
CA12	West of Wistow Road (new access point)	CRC 1-4	✓	
CA13	North of Sherburn Road (new access point)	CRC 1-4	✓	
CA14	South of Sherburn Road (new access point)	CRC 1-4	✓	
CA15	East of Dam Lane (new access point)	CRC 1-4	✓	
CA16	West of Dam Lane (1) (existing access point)	CRC 1-4	✓	✓
CA17	West of Dam Lane (2) (existing access point)	CRC 1-4	✓	
CA18	West of Dam Lane (3) (existing access point)	CRC 1-4	✓	
CA19	North of Harry Moor Lane (existing access point)	CRC 1-4	✓	✓
CA20	West of Harry Moor Lane (existing access point)	CRC 1-4	✓	✓
CA21	South of A63 (existing access point)	CRC 1-4	✓	✓
CA22	North of Whinny Hagg Lane (existing access point)	CRC 1-4	✓	

Access	Description	Cable Corridor No.	Construction Phase	Operational Phase
CA23	East of Whinny Hagg Lane (existing access point)	CRC 1-4	✓	
CA24	North of Field Lane (new access point)	CRC 1-4	✓	
CA25	South of Field Lane (new access point)	CRC 1-4	✓	
CA26	South of Hillam Road (existing access point)	CRC 1-4	✓	
CA27	North of Hillam Common Lane (1) (existing access point)	CRC 2-4	✓	
CA28	East of Fox Lane (existing access point)	CRC 1-4a	✓	
CA29	North of Hillam Common Lane (2) (existing access point)	CRC 2-4	✓	
CA30	West of Fox Lane (existing access point)	CRC 1-4a	✓	
CA31	Common Lane (existing access point)	CRC 2-8	✓	
CA32	North of A63 (existing access point)	CRC 2-8	✓	
CA33	North of Common Lane (existing access point)	CRC 2-8	✓	
CA34	South of Common Lane (existing access point)	CRC 2-8	✓	
CA35	North of Fryston Common Lane (new access point)	CRC 2-6	✓	
CA36	South of Fryston Common Lane (new access point)	CRC 2-6	✓	

Access	Description	Cable Corridor No.	Construction Phase	Operational Phase
CA37	Fairfield Lane (existing access point)	CRC 4-POC	✓	
CA38	South-east of Hillam Lane (new access point)	CRC 4-POC	✓	
CA39	East of A162 (existing access point)	CRC 4-POC	✓	✓
CA40	West of A162 (existing access point)	CRC 4-POC	✓	✓
CA41	East of Rawfield Lane (existing access point)	CRC 4-POC	✓	✓
CA42	Ingthorne Lane (new access point)	CRC 2-6		✓
CA43	Roe Lane (existing access point)	CRC 4-POC	✓ (AIL access only)	

2.5.73 It is envisaged that the above accesses will be used for the construction phase and a select few (detailed above) will be used to allow access for inspections and maintenance during the Operation Phase (with the land that makes up the detailed Cable Route Corridor itself (and associated easements) then able to be utilised to access the rest of the corridor.

Highway Improvement Areas

2.5.74 Highway improvements will be made to facilitate the construction traffic movements for the Proposed Development. The locations of the Highway Improvement Areas are shown on Figure 1.2 (ES Volume 2) [**EN0110012/APP/LVS/06.02.01.02**].

2.5.75 Works within the Highway Improvement Areas comprise improvements to the existing highway such as vegetation management, minor works to enable construction vehicle movements such as provision of temporary passing places within the existing highways boundary, traffic management, and provision of visibility splays.

2.5.76 To safely accommodate AIL vehicle movements along construction routes, Highway Improvement Areas in the wider area are also required. These comprise minor, temporary modifications and include the removal of street furniture, widening of junctions, and vegetation removal. These Highways Improvement Areas are listed below and shown in Figure 1.2 (ES Volume 2) [**EN0110012/APP/LVS/06.02.01.02**]:

1) Weldrake Lane;

2) Skipwith Road;
3) Main Street, Westfield and Glade Road, Skipwith
4) King Rudding Lane, Riccall
5) Main Street, Checker Lane and A19, Riccall;
6) Selby Road, Pinfold Hill and Woodall Court, Wistow;
7) Bishopdyke Road and Long Lane, Wistow;
8) Long Lane and Broad Lane, Wistow;
9) Garman Carr Lane, Wistow;
10) Lordship Lane, Garman Car Lane and Sand Lane, Wistow;
11) Black Fen Lane, Selby;
12) Carr Lane, Wistow
13) Pinfold Hill, Wistow
14) Sherburn Road, Wisow Road and B1223, Selby;
15) Hospital Lane and Greenlands Lane, Selby;
16) Dam Lane, Thorpe Willoughby;
17) Harry More Lane and A1238, Thorpe Willoughby;
18) Common Lane, South Milford;
19) Leeds Road, Thorpe Willoughby;
20) Main Road, Gateforth Lane and St Mary's Approach, Hambleton;
21) A63, Thorpe Willoughby;
22) Morrets Lane, Hambleton;
23) Gateforth Lane and Field Lane, Hambleton;
24) Common Lane and A63, Hambleton;
25) A162, Monk Fryston;
26) Hillam Common Lane, Hillam;
27) Hillam Road, Hillam;
28) Fox Lane, Hambleton;
29) Fryston Comon Lane, Monk Fryston;
30) Common Lane, Hambleton;
31) Roe Lane, Hillam;
32) Hillam Lane and Fairfield Lane, Hillam;
33) Roe Lane and Haddlesey Road, Birkin; and
34) Birkin Lane and Haddlesey Road, Birkin.

Landscaping, Ecological Mitigation and Enhancement

2.5.77 The Solar Development Sites currently comprise arable and pastoral fields. There are existing features within the Solar Development Sites such as hedgerows, field margins, ditches and watercourses which are considered to have some ecological value.

2.5.78 The outline environmental masterplan for the Proposed Development is illustrated on the Outline Environmental Masterplan [**EN0110012/APP/LVS/02.12**]. The mitigation and enhancement commitments sought to be delivered, and the principles for how the land will be managed throughout the operation phase are set out within the Outline Landscape and Ecological Management Plan (oLEMP) [**EN0110012/APP/LVS/07.05**]. The detailed Landscape and Ecological Management Plan(s) will provide final details of the environmental masterplan and management measures, and must be in substantial accordance with that oLEMP.

2.5.79 The Proposed Development will involve new planting, field boundary enhancement and planting of seed mixes within the Solar Development Sites as illustrated on the Outline Environmental Masterplan [**EN0110012/APP/LVS/02.12**]. The Outline Environmental Masterplan is an illustration of how the mitigation and enhancement commitments set out in this ES could be delivered. The delivery of those commitments is secured via the oLEMP [**EN0110012/APP/LVS/07.05**] included within the DCO Application.

2.5.80 The enhancements and planting would increase biodiversity and contribute to the Proposed Development achieving Biodiversity Net Gain (BNG). Further information is provided within Chapter 6: Biodiversity (ES Volume 1) [**EN0110012/APP/LVS/06.01.06**], Chapter 10: Landscape and Visual Impact Assessment (ES Volume 1) [**EN0110012/APP/LVS/06.01.10**], Chapter 12: Ornithology (ES Volume 1) [**EN0110012/APP/LVS/06.01.12**] and the BNG Report [**EN0110012/APP/LVS/05.09**].

2.5.81 Approximately 61 ha within the Order Limits, situated in southern extent of Solar Development Site 1 will be retained as a non-breeding bird mitigation area. This area, referred to as the 'Bird Mitigation Area', will be multifunctional, designed to support both breeding and non-breeding bird assemblages. Details of the creation and management of the Bird Mitigation Area is provided in the oLEMP [**EN0110012/APP/LVS/07.05**]. An Outline Bird Mitigation Area Management Plan [**EN0110012/APP/LVS/07.19**] is included within the application and outlines how measures proposed will provide mitigation for the anticipated displacement of wetland birds associated with Lower Derwent Valley and the Humber Estuary SPA and Ramsar site as a result of the Proposed Development

2.5.82 The oLEMP [**EN0110012/APP/LVS/07.05**] has been developed to support the DCO Application. This sets out the principles for managing, reinstating, enhancing, and creating new landscape and ecological features on, the land within the Solar Development Sites during the operation and maintenance phase after construction is completed. Prior to the commencement of any phase of development, a detailed LEMP will be prepared and submitted to and approved

by the relevant planning authority (in this case North Yorkshire Council), and this is secured by Requirement in the DCO. This will ensure the potential construction and operational impacts are minimised and that, where practicable, opportunities for beneficial effects are secured as part of the Proposed Development. The LEMP must be prepared substantially in accordance with the oLEMP [**EN0110012/APP/LVS/07.05**] which is submitted as part of the DCO application.

Permissive Paths

2.5.83 Permissive paths are incorporated into the Proposed Development design, as shown the Outline Environmental Masterplan [**EN0110012/APP/LVS/02.12**]. The permissive paths will contribute to the wider network of public rights of way in the area and facilitate greater public access to the countryside during the lifetime of the Proposed Development. The design and implementation of the permissive paths is set out in the Outline Public Rights of Way Management Plan (oPRoWMP) [**EN0110012/APP/LVS/07.09**] and oLEMP [**EN0110012/APP/LVS/07.05**] and secured by a Requirement in the Draft DCO [**EN0110012/APP/LVS/03.01**].

Surface Water Drainage

2.5.84 The Outline Drainage Strategy (ES Volume 3) **[EN0110012/APP/LVS/06.03.15.04]** has been prepared to support the DCO Application. The strategy identifies how the Proposed Development would manage surface water across the Solar Development Sites and not increase flood risk. It details measures to manage the surface water drainage from the Proposed Development (e.g. Solar Development Sites, access tracks and areas of hardstanding across the Order Limits) and any required changes needed to existing land drainage. The strategy will be developed into a detailed drainage strategy prior to construction secured by a Requirement in the Draft DCO [**EN0110012/APP/LVS/03.01**].

2.6 Environmentally led design

2.6.1 NPS-1 (Ref 17) paragraph 4.7.5 states that “To ensure good design is embedded within the project development, a project board-level design champion could be appointed, and a representative design panel used to maximise the value provided by the infrastructure. Design principles should be established from the outset of the project to guide the development from conception to operation.”

2.6.2 On 23 October 2024 the Planning Inspectorate (PINS) released the Nationally Significant Infrastructure Projects: Advice on Good Design guidance note (Ref 10). The PINS’ advice sets out practices that encourage a holistic approach to delivering high quality, sustainable infrastructure that responds to place and takes account of often complex environments by adopting four high-level principles of climate, people, place and value for infrastructure.

2.6.3 Island Green Power (IGP) UK limited, the parent company for Light Valley Solar Limited, has identified a senior leader within its Projects Team as responsible for

championing good design across all IGP's projects, including Light Valley Solar. Their role is to report to the IGP Board, who hold overall accountability.

2.6.4 With this senior leadership from IGP, the Light Valley Solar management team is enabled to prioritise good design at all times. The outcome is that engineering decisions are informed, proposed development is steered away from sensitive locations, and land needed for delivery of suitable mitigation measures is incorporated.

2.6.5 IGP has set out the following overarching set of principles that it applies to all projects to deliver good design, including Light Valley Solar. The outcome for all projects is to achieve sustainable developments that are sensitive to place, with limited adverse environmental effects, making efficient use of natural resources and energy in construction and operation. The principles are as follows:

1) **Decarbonisation and Energy Security -** Proposed Developments will be designed to maximise their clean energy generation potential. They will contribute to the ensuring energy security and help deliver the UK's legally binding climate change target of achieving net zero carbon emissions by 2050, ensuring that the energy supply remains secure, reliable, and affordable.

2) **Environmentally led design -** Proposed Developments will be sensitively designed to consider the surrounding environment, for example, recognising the intrinsic character of the surrounding landscape, being sensitive to heritage assets and their setting and minimising impacts on best and most versatile land.

3) **Biodiversity net gain and Nature Recovery -** Proposed Developments will make a positive contribution to the local environment as well as delivering a measurable net gain for biodiversity through strategic habitat creation and enhancement measures along with good management practices through operation.

4) **Design flexibility -** Designed with input from the local community, the Proposed Developments will retain flexibility to enable them to adapt over time, be functional and fit for purpose, and respond to innovative and new technologies as well as building resilience to climate change.

5) **Social value and community -** Proposed Developments will look for opportunities to deliver benefits in consultation with local community. This will include prioritising local recreation, and access, minimising disruption to Public Rights of Way during all project phases and enhancing local walking routes where practicable, including exploring options for permissive paths to create longer circular walks.

6) **Efficient infrastructure & ethical supply chain -** Proposed Developments will be designed to maximise operational efficiency through the use of advanced, ethically sourced technologies and optimised site layout, ensuring consistent energy output with minimal losses.

7) **Sustainability, Durability, and Reversibility -** Proposed Developments will be designed to deliver reliable sustainable energy, ensuring that installations remain temporary and can be fully reversed if necessary.

8) **Commitment to Mitigation -** Adherence to the mitigation hierarchy to reduce impacts and control any adverse effects on the environment throughout the lifecycle of the project from construction through to operation, maintenance and decommissioning.

2.6.6 The Design Approach Document [**EN110012/APP/LVS/05.5**] outlines the preparation and evolution of the Proposed Development design and how the Design Principles for the Proposed Development have informed the pre application design development of the Proposed Development and the Design Parameters and Commitments that have ultimately been committed to, taking into account the IGP design principles and the EIA process. The Design Parameters and Commitments form part of the mitigation of the Proposed Development taken into account in the assessments in this ES.

2.6.7 Figure 2.1: Illustrative Site Layout Plans (ES Volume 2) [**EN110012/APP/LVS/06.02.02.01**] presents the illustrative site layout plans for all seven of the Solar Development Sites illustrating, amongst others, proposed locations for the solar panels and solar exclusion areas, blue/green infrastructure opportunities and proposed landscape set-backs. These Plans reflect one way in which the Proposed Development could be brought forward in compliance with the Design Parameters and Commitments Document [**EN0110012/APP/LVS/05.06**] and the limits of deviation shown on the Works Plans **[EN0110012/APP/LVS/02.03]**.

2.7 Construction Phase

Construction Programme

2.7.1 Subject to being granted development consent and following a final investment decision, the earliest construction could start is in 2028. Construction work is unlikely to start on the Solar Development Sites in all locations at the same time. Each individual Solar Development Site 1-4 and 6-8 and the Cable Route Corridors would likely require different lengths of construction given their variance in size, and therefore there would be some overlap between them. Construction works within the Cable Route Corridor would commence with multiple teams spread along the route. It is estimated that the construction period would require approximately 24-36 months in total. Table 2-6 indicates the potential construction durations across the different parts of the Proposed Development, showing a series of overlapping stages. This programme is indicative only and is subject to change. Solar Development Site 3 for example is indicated to be final Solar Development Site to be constructed and this may not be the case.

2.7.2 As a worst case scenario, for the purposes of this ES, construction is assumed to take place at all Solar Development Sites and across the Cable Route Corridor all at once.

Table 2-6 Indicative Construction Programme

Aspect	Month																												
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29
Bird Mitigation Area	■	■	■	■	■	■																							
Solar Development Site (SDS) 1	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■			
SDS 2	■	■	■	■	■	■	■	■	■	■	■	■																	
SDS 3																								■	■	■	■	■	■
SDS 4	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
SDS 6	■	■	■	■	■	■	■	■	■	■	■	■																	
SDS 7												■	■	■	■	■													
SDS 8																■	■	■	■	■	■	■	■	■	■				
Point of Connection Works																	■	■	■	■	■	■	■	■	■	■	■	■	■
BESS and Substations	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■			
Cable Route Corridor	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■					

2.7.3 Whist there are commitments within the oCEMP **[EN0110012/APP/LVS/07.02]** that will be adhered to, there are no seasonal restrictions on the construction of the Proposed Development apart from on Solar Development Site 1 and a section of CRC 1-4 (Solar Development Site 1 to Thorpe Willoughby). Construction works within the southern portion of Solar Development Site 1 (250 m section; see Figure 12.4 [**EN0110012/APP/LVS/06.02.12.4**] and the Shadow Habitat Regulations Assessment [**EN0110012/APP/LVS/05.11**]) that adjoin the bird mitigation area (BMA) will be limited to construction activities that do not give rise to noise levels equal to or above 50dB during the non-breeding period. Construction works that are likely to generate noise levels above 50dB will be undertaken during the breeding season only (specifically April–August) when qualifying species presence is considered low and not ornithologically meaningful.

2.7.4 The construction of the Cable Route Corridor located within the SSSI Impact Risk Zone (Solar Development Site 1 to Thorpe Willoughby) will be limited to the breeding and passage season only (April-October), to enable avoidance of the sensitive non-breeding period. Construction of the Cable Route Corridor located outside of this zone is not limited seasonally due to its temporary impacts and the BMA being functional.

2.7.5 Once the BMA is established and functioning as a higher-capacity refuge of improved habitat quality, construction throughout the Order Limits will not be subject to further seasonal restriction, with the exception of the Cable Route Corridor which lies within the SSSI IRZ (limited to April to October) and the southern portion of Solar Development Site 1 (April-August and as set out in paragraph 2.7.3 above).

2.7.6 During the operational phase, planned solar PV replacement within Solar Development Site 1 will be limited to the breeding period (April to August) within the southern proportion of the solar array area only.

Construction Activities

Site Preparation and Enabling/Civil Engineering Works for the Solar Development Sites

2.7.7 The following activities would be required as part of the site preparation and enabling works (not necessarily in order):

1) Construction of site entrance and construction vehicle delivery holding area;
2) Establishment of the main temporary construction compounds for the Cable Route Corridor (Cable Construction Compounds), which include site offices/welfare area and parking area and establishment of temporary laydown areas for the Cable Route Corridor at the Cable Route Corridor access points;

3) Establishment of the temporary Solar Development Site Construction Compounds/laydown areas within the Solar Development Sites
4) Construction of the internal access roads;
5) Upgrade, modification or improvement of highways where required for site construction;
6) Diversion and/or connecting to existing utilities such as DNO power lines, sewage, water and telephone lines as required;
7) Preparation of land for construction, including localised site levelling (if/where required) and vegetation clearance;
8) Import of construction materials, plant and equipment to site;
9) Establishment of the construction area fence where required for construction works to progress (the installation of the perimeter fence would progress with site construction in each area and therefore would not be complete at the start of site construction); and
10) Marking out the location of the operational infrastructure.

2.7.8 The Cable Construction Compounds and Solar Development Site Construction Compounds locations are shown on the Works Plans **[EN0110012/APP/LVS/02.03].** The temporary laydown areas may be located anywhere within the Solar Development Sites and the Cable Route Corridor. The assessments in the ES have been carried out accordingly.

Installation of Solar PV Panels

2.7.9 The following activities would be required to install the Solar PV Panels;

1) Import of components to site;
2) Piling and erection of module mounting structures;
3) Mounting of modules would be undertaking using hand-held power tools;
4) Trenching and installation of electric cabling;
5) Transformer, inverter and switchgear foundation excavation and construction;
6) Installation of transformers, inverters and switchgears. Cranes would be used to lift equipment into position; and
7) Installation of control systems, monitoring and communication.

Construction of Electrical Infrastructure

2.7.10 The following activities would be required to construct the onsite electrical infrastructure:

1) Site preparation and civils for the onsite substations and control buildings;
2) Trenching and installation of electric cabling;

3) Pouring of the concrete foundations and plinths for the electrical equipment;
4) Import of components to site;
5) Cranes would be used to lift the components into position; and
6) Installation of the Conversion Units.

Construction of On-Site Cabling

2.7.11 For cables between the Conversion Units and the substations within the Solar Development Sites, the following methodology and works description applies:

1) Underground cables, including EHV power cables, would be laid to provide a link between the Solar PV arrays, the transformer/Conversion Unit stations and the substations where the main switchgear panels are located. There would also be underground cables from the BESS Compound to the 275 kV substation.
2) Generally, onsite cables would be laid underground in excavated trenches adjacent to onsite tracks where practicable and between the rows of Solar PV Panels. They would be laid at a suitable depth and positioned at a distance far enough away from the Solar PV Mounting Structures to allow future repair or maintenance. Some sections of cable may be installed in ducting if required to provide additional protection or where other infrastructure such as roads and hardstanding would be built over the top.
3) Where at all practicable, trenching would be carried out using a trapezoidal bucket to ensure stability during installation. Trenching and cable laying would be carried out progressively across the Site and be phased to not interfere with other site operations such as piling, Solar PV Mounting Structure assembly or Solar PV Panel installation.
4) Care would be taken to ensure cable trench excavations can be managed and backfilled in a timely manner to avoid collapse. Trenching may be curtailed in periods of wet weather to avoid collapse of trenches of excessive contaminated run off.

BESS Construction

2.7.12 The following activities would be required to construct the BESS:

1) Construction of compound including fencing, drainage/containment installation and fire safety measures;
2) Construction of foundations;
3) Import of components to site;
4) Installation of electric cabling;
5) Operations building;
6) Installation of transformers; and
7) Installation of batteries, Conversion Units and switchgear.

Fencing and security

2.7.13 The permanent deer fence and security system would be established during the construction phase. The fencing would be installed early on in the works where practicable to reduce the amount of temporary fencing needed. Where required, temporary fencing would be installed to secure work areas not naturally contained by existing hedgerows or fencing.

Cable Route Corridor Construction

2.7.14 Refer to Appendix 2.1: Cable Route Corridor Construction Method Statement (ES Volume 3) **[EN110012/APP/LVS/06.03.02.01]** for information regarding the Cable Route Corridor construction.

Testing and Commissioning

2.7.15 Commissioning of the Proposed Development would include testing and commissioning of the process equipment. Commissioning of the Solar PV Panels, BESS Battery Containers, and associated infrastructure would involve mechanical and visual inspection, electrical and equipment testing, and commencement of electricity supply into the National Grid. Individual sub-systems would be commissioned separately with each having its own procedures and prerequisite lines, and it may be necessary to commission these elements separately or at the same time, depending on the end technology utilised at the time of construction.

2.7.16 This process would take place prior to the operation phase of the Proposed Development.

Construction staff and hours of work

2.7.17 Initial worker number assumptions have been derived to inform the ES. A peak of 770 construction workers (298 Full Time Equivalent (FTE) jobs) and an average of 385 construction workers is anticipated to be working across the seven Solar Development Sites during the day. In addition, there will be a peak of 120 construction workers (46.5 FTE jobs) distributed along the Cable Route Corridor with an additional peak of 35 staff delivering equipment to the Cable Route Corridor.

Construction hours of work

2.7.18 The core construction working hours (not including start-up and shut-down works described below) are defined as:

1) Monday to Friday from 07:00 to 18:00;
2) Saturday from 08:00 to 13:30; and
3) No Sunday or Bank Holiday working unless crucial to construction (for example for HDD which must be a continuous activity meaning 24 hour working may be required) or in an emergency.

2.7.19 Start-up and shut-down activities on site will involve low-noise tasks, including security checks, unlocking and locking gates, and conducting toolbox talks.

2.7.20 Some activities may be required outside of the core working hours (such as the arrival and departure of construction workers, the delivery of abnormal loads, concrete pours for foundations, HDD, nighttime working for cable construction works in public highways, or in emergencies). The Contractor(s) will seek prior approval from the relevant authority for works outside the core working hours.

2.7.21 The CTMP will commit to measures to encourage construction vehicles avoiding the need to travel during the network peak hours. Therefore, deliveries will be scheduled for between 09:30 and 16:30, unless this not practically possible following delays or an emergency (or if deliveries are required for activities requiring 24 hour activity such as HDD). Construction worker shifts will be scheduled so that workers are not travelling during the network peak hours of 08:00-09:00 and 17:00-18:00.

Proposed Development access and construction traffic

2.7.22 Construction traffic and Site access is discussed further in Chapter 14: Traffic and Movement (ES Volume 1) [**EN110012/APP/LVS/06.01.14**].

2.7.23 The construction traffic associated with the Proposed Development will be subject to measures and procedures defined within a Construction Traffic Management Plan (CTMP). This is by a Requirement in the DCO and will be prepared substantially in accordance with the oCTMP [**EN110012/APP/LVS/07.12**]. This defines information such as the routes that construction traffic must take and the measures that will be implemented to reduce the effect of the construction phase on the local highway network.

2.7.24 The construction traffic routes to the Solar Development Sites that are identified in the oCTMP **[EN0110012/APP/LVS/07.12]** represent the most suitable direct route to the relevant access from the strategic road network.

Construction traffic

2.7.25 The Transport Assessment **[EN0110012/APP/LVS/06.03.14.01]** provides an estimate of the total number of daily HGV movements expected per site and an estimate of the number of average vehicle movements required per day based on a peak taken from the indicative construction programme in Table 2-6.

2.7.26 As discussed above, shared transport for construction workers will be developed. Shared transport will be particularly important for non-local workers, who will be staying in local accommodation and be transported to the sites. It will also be utilised by other workers as appropriate. For assessment purposes in this ES, it has been assumed that 50% of staff trips will be made by shared transport, with a vehicle occupancy of 12 people. It is assumed that the other 50% of staff trips would be made by car, with an occupancy of 1.5 per vehicle. The resulted trip generation associated with construction workers is set out in the Transport Assessment **[EN0110012/APP/LVS/06.03.14.01].**

Abnormal Indivisible Loads (AILs)

2.7.27 There will be a number of abnormal load movements associated with the construction of the Proposed Development as outlined in Table 2-7. The transformers will be up to approximately 10m in length, 4m in width and 4.9m in height, weighing up to 155 tonnes.

Table 2-7 Summary of Abnormal Load movements for Solar Development Sites

Solar Development Site	Number of AILs
Solar Development Site 1	2
Solar Development Site 2	5
Solar Development Site 3	0
Solar Development Site 4	3
Solar Development Site 6	0
Solar Development Site 7	0
Solar Development Site 8	0
Total	9

2.7.28 In addition, there will be deliveries of cable drums to the cable route corridor which are considered AILs. There will be approximately 156 AIL movements associated with cable drum deliveries over the length of the Cable Route Corridor.

2.7.29 The abnormal load movements will be co-ordinated with the local highway authorities and police prior to being undertaken. However, they will be managed and take place during quieter periods on the local highway network. The effect on the local highway network will be temporary.

2.7.30 Traffic management will be required at various locations for all abnormal load movements for the Proposed Development. To the extent not already accounted for in the DCO Application, traffic management measures will be agreed with North Yorkshire Council, National Highways if such measures are required on the strategic road network and police prior to the movement taking place.

Temporary construction compounds

2.7.31 Temporary construction compounds would be established within the Solar Development Sites and along the Cable Route Corridor. The temporary construction compounds would comprise:

1) Temporary portacabins for construction operatives (the dimension of the portacabins would vary and the maximum size for individual units is expected to be 12 m by 3 m with a typical maximum height of 3 m);

2) Perimeter security fencing with a typical maximum height of 3 m;
3) Parking area for construction and workers vehicles (confirmation of parking area locations will occur as part of the detailed OEMP. Any changed locations would not lead to any materially worse effects than those assessed in the DCO Application);
4) Secure compound for storage;
5) Temporary hardstanding;
6) Wheel washing facilities;
7) Temporary gated compound;
8) Storage bins/tanks for materials, recyclables and other waste; and
9) Lighting (as set out below).

2.7.32 There will also be temporary laydown areas progressively established across the Solar Development Sites. The purpose of each one will be to service the local works. This includes but is not limited to storage for materials, fuel, equipment needed for such works as well as welfare facilities, office space required to avoid unnecessary internal movement of personnel over long distances. The temporary laydown areas will typically be set up ahead of the installation of the Solar Development Sites, electrical components and cabling and will be decommissioned as the relevant works in their locality progress and become completed. Upon completion of construction, the compound/laydown areas within the Solar Development Sites will be removed and the land reinstated unless to be used for other solar infrastructure as outlined on the Works Plans [**EN110012/APP/LVS/02.03**].

2.7.33 It is anticipated that goods would be delivered by HGV to the construction compounds within the Solar Development Sites and then distributed to the point of need within the Solar Development Sites using lighter vehicles (e.g. tractor and trailer) as required. These would be internal movements between the construction compound and a location within the Solar Development Site only, and these movements would not use the public highway

2.7.34 Temporary construction compounds would be located along the Cable Route Corridor at locations shown on the Works Plans [**EN110012/APP/LVS/02.03**], along with additional laydown areas. The laydown areas will likely be located at each of the Cable Route Corridor access points and will allow construction vehicles to turn off the public highway and park safely. Laydown areas will include parking bays, portacabins, welfare facilities, unloading and storage areas and power generators. The areas will be secured using Heras fencing (or similar) and security cameras. Upon completion of construction, the compound/laydown areas will be removed and the land reinstated.

2.7.35 The construction compounds and laydown areas will include areas of hardstanding which would be made out of granular material. In locations that are identified as being at greater risk from contamination releases (see Appendix 15.1: Flood Risk Assessment (ES Volume 3)

[**EN0110012/APP/LVS/06.03.15.01]** and the Outline Drainage Strategy (ES Volume 3) **[EN0110012/APP/LVS/06.03.15.04]**) a non-permeable 'Durabase Mat System' or a similar non-ground penetrating mat system would be installed to protect groundwaters during construction, as outlined within the oCEMP [**EN0110012/APP/LVS/07.02**].

2.7.36 Each of the Construction Compounds are outlined in further detail below.

Solar Development Site 1 Construction Compound A

2.7.37 Solar Development Site 1 Construction Compound A will be situated east of Easterby's Plantation in Field 1.47.

Solar Development Site 1 Construction Compound B

2.7.38 Solar Development Site 1 Construction Compound B will be situated on the western side of Solar Development Site 1 in Field 1.20, to the west of Mount Pleasant Farm.

Solar Development Site 2 Construction Compound

2.7.39 Solar Development Site 2 Construction Compound will be situated in the field on the western (Field 2.4) side of the access road off the A63.

Solar Development Site 4 Construction Compound A

2.7.40 Solar Development Site 4 Construction Compound A will be situated west of Roe Lane, east of the proposed 275 kV Substation in the northwestern part of Solar Development Site 4 within Field 4.4.

Solar Development Site 4 Construction Compound B

2.7.41 Solar Development Site 4 Construction Compound B will be situated within Field 4.5, east of the proposed 275 kV Substation, adjacent to an existing Biomass operation, within the northern part of Solar Development Site 4.

Solar Development Site 4 Construction Compound C

2.7.42 Solar Development Site 4 Construction Compound C will be situated within Field 4.14 off Haddlesey Road/Birkin Road in the southern part of Solar Development Site 4.

Solar Development Site 6 Construction Compound

2.7.43 Solar Development Site 6 Construction Compound will be situated within Field 6.3 off Common Lane, south of Milford Common Drain and west of Lumby Common Drain.

Solar Development Site 8 Construction Compound

2.7.44 Solar Development Site 8 Construction Compound will be situated within Field 8.1 off Phillip Lane, within the eastern side of Solar Development Site 8.

Cable Construction Compound 1

2.7.45 Compound 1 will be situated along CRC 1-4 between Solar Development Sites 1 and 4, approximately 975 m north of Thorpe Willoughby within field CR234.

Cable Construction Compound 2

2.7.46 Compound 2 will be situated along CRC 1-4 between Solar Development Sites 1 and 4, approximately 700 m north of Selby, to the south of the River Ouse within field CR181.

Cable Construction Compound 3

2.7.47 Compound 3 will be situated along CRC 1-4 between Solar Development Sites 1 and 4, approximately 165 m east of Riccall within field CR93.

Cable Construction Compound 4

2.7.48 Compound 4 will be situated along CRC 1-4 between Solar Development Sites 1 and 4, approximately 445 m south of Hambleton within field CR304.

Cable Construction Compound 5

2.7.49 Compound 5 will be situated along CRC 4-POC, approximately 525 m south of Hillam within field CR413.

Cable Construction Compound 6

2.7.50 Compound 6 will be situated on the eastern side of Solar Development Site 2 within Field 2.5. This compound may also be used for construction activities associated with the development of Solar Development Site 2.

2.7.51 There will be no other construction compounds within the Solar Development Sites or along the Cable Route Corridor.

Waste management

2.7.52 The Proposed Development is likely to generate waste consisting of general construction waste, including packaging waste from materials and construction materials from access roads and supporting infrastructure. During construction, the removal of waste has been accounted for in the estimated HGV deliveries a day (see Transport Assessment **[EN0110012/APP/LVS/06.03.14.01]**). During operation, it is anticipated that waste generation would be minimal, likely to be limited to disposal of equipment that needs to be replaced (e.g. solar panels). Waste would be disposed of responsibly and undertaken in alignment with the principles of recycling available at that time.

2.7.53 The Proposed Development would be managed during its construction in accordance with a Construction Environment Management Plan (CEMP), a Materials and Waste Management Plan (MWMP) and a Soil Resource Management Plan (SRMP). An Outline CEMP [**EN0110012/APP/LVS/07.02**], Outline MWMP [**EN0110012/APP/LVS/07.07**] and Outline SRMP [**EN0110012/APP/LVS/07.14**] are included within the DCO application to secure the Applicant's commitments relating to these matters. These management plans incorporate embedded and good practice measures, as well as any further mitigation that arises out of the EIA process. Outline versions of these management plans are submitted alongside the ES as part of this DCO Application to secure the commitments within each assessment. A Requirement is included in the draft DCO [**EN0110012/APP/LVS/03.01**] to ensure detailed management plans will be prepared to full versions by the appointed Contractor(s), substantially in accordance with the outline management plans, and will be submitted for approval by North Yorkshire Council in advance of starting the relevant phase of works.

Fuel

2.7.54 Fuel for machinery and generators would be delivered by a fuel bowser as required and are anticipated to be stored within the construction compounds and laydown areas in integrally bunded above ground fuel storage tanks (cubes) which comply with the Oil Storage Regulations (Ref 11). The fuel storage tanks would be sheltered, secured from unauthorised access, and equipped with integral bunding capable of holding 110% of the volume of the tank (i.e. it would have 10% more capacity than needed). Spill kits would be carried by all plant and would be available at the fuelling point and other strategic locations on the Site to allow for prompt clean up. All construction workers would be trained in pollution prevention and spill kit use. Oil storage areas should avoid areas susceptible to flooding. Fuel would be handled and stored in accordance with the Outline Pollution and Spillage Response Plan **[EN0110012/APP/LVS/07.08]**.

Water

2.7.55 An estimated 21,059 m^3 total of water would be required during construction to support welfare facilities on-site and other uses, or approximately 53 m^3/day during peak months.

2.7.56 Water will be transported to the Site by road from either an existing nearby licenced water abstraction source, using existing sources being used for current agricultural practices, where viable; or surface water sources; and stored on site. Water would be stored within water storage tanks primarily within the Construction Compounds and laydown areas. Water tanks would also be used at HDD locations when HDD is taking place. Where mains water is available this would also be utilised. See the Water Resources Assessment for further information **[EN0110012/APP/LVS/07.16]**.

2.7.57 During construction self-contained portable welfare units which store foul/wastewater for collection/emptying by specialist licenced contractors would be used within the compounds.

Power supply

2.7.58 To facilitate construction, connecting to existing low voltage overhead power lines will be considered to provide power to the construction compounds. If connections to existing overhead power lines are unavailable, then on-site generators maybe required. An oCEMP [**EN0110012/APP/LVS/07.02**] has been prepared to accompany the DCO application and includes management and mitigation measures that would be able to apply to works associated with the connection to existing utilities, and protective provisions for apparatus owners are included in the draft DCO [**EN0110012/APP/LVS/03.01**].

2.7.59 If generators are used, then appropriate environmental control measures would be applied, as outlined in the oCEMP, including, but not limited to appropriate siting away from sensitive receptors, noise control measures; limits to hours of use.

Construction lighting

2.7.60 Temporary site lighting would be used during construction to enable safe working during construction in hours of darkness or where natural lighting is unable to reach (such as sheltered/confined areas). Mobile lighting towers with an anticipated power output of 8 kilo volt-amperes (kVA) would be used for construction work, along with lighting at the construction compounds and temporary laydown areas while construction is underway.

2.7.61 All construction lighting will be deployed in accordance with the following to prevent or reduce the impact on human and ecological receptors:

1) The use of lighting will be minimised to that required for safe site operations;
2) Lighting will utilise directional fittings to minimise outward light spill and glare (e.g. via the use of light hoods/cowls which direct light below the horizontal plane, preferably at an angle greater than 20° from horizontal); and
3) Lighting will be directed towards the middle of the works areas rather than towards the boundaries.

2.7.62 Measures to control lighting are set out in the oCEMP [**EN0110012/APP/LVS/07.02**].

Construction Environmental Management Plan

2.7.63 An Outline Construction Environmental Management Plan (oCEMP) [**EN0110012/APP/LVS/07.02**] has been prepared to support the DCO Application. The oCEMP describes the framework of mitigation measures to be

followed and to be carried forward to a detailed CEMP prior to construction. The aim of the oCEMP is to avoid and/or reduce environmental impacts from:

1) Use of land for temporary laydown areas, accommodation etc;
2) Construction traffic (including parking and access requirements) and any changes to access and temporary road or footpath closure;
3) Noise and vibration;
4) Utilities diversion;
5) Dust generation;
6) Handling of soil resources;
7) Spillages of oil and other chemicals;
8) Run off and drainage;
9) Surface water management;
10) Lighting; and
11) Waste generation.

2.7.64 The oCEMP [**EN0110012/APP/LVS/07.02**] will be used as the basis for the Contractor to prepare detailed CEMPs prior to construction and following the detailed design of the Proposed Development. It may be that more than one CEMP is produced, as individual CEMPs may be produced and approved for different parts of the Proposed Development[1].

2.7.65 The detailed CEMP would be approved by North Yorkshire Council following the grant of the DCO and prior to the start of construction. It would identify the procedures to be adhered to and managed by the contractor throughout construction and would clearly define roles and responsibilities. Production of the detailed CEMP is secured through a Requirement in the Draft DCO [**EN0110012/APP/LVS/03.01**].

2.7.66 Contracts with companies involved in the construction works would incorporate environmental control, health and safety regulations, and current guidance. This would ensure that construction activities are sustainable and that all contractors involved with the construction phase are committed to agreed good practice and meeting all relevant environmental legislation including:

1) Control of Pollution Act 1974 (Ref 12);
2) Environment Act 2021 (Ref 13);
3) Hazardous Waste (England and Wales) Regulations 2005 (as amended) (Ref 14); and
4) Waste (England and Wales) Regulations 2011 (Ref 15).

[1] More than one version of management plans may be required when the detailed management plans are produced.

2.7.67 Records would be kept and updated regularly, ensuring that all waste transferred or disposed of has been appropriately processed with evidence of signed Waste Transfer Notes (WTNs) that would be kept on-site for inspection whenever requested. Furthermore, all construction works would adhere to the Construction (Design and Management) Regulations 2015 (CDM) (Ref 16).

Site Re-instatement, Biodiversity and Landscaping

2.7.68 Following construction, a programme of site reinstatement will commence. Embedded mitigation measures for the construction phase are set out in the oCEMP [**EN0110012/APP/LVS/07.02**], including measures such as construction and exclusion zones in relation to retained vegetation, ensuring a tidy and neat working area, covering stockpiles and storing topsoil in accordance with good practice measures.

2.7.69 An Outline Landscape and Ecological Management Plan (oLEMP) [**EN0110012/APP/LVS/07.05**] has been prepared to support the DCO Application. This document sets out the principles for how the land will be managed throughout the operation phase, following the completion of construction. A detailed LEMP will be produced for approval following the granting of the DCO and prior to the start of construction (this is secured by a requirement in the Draft DCO [**EN0110012/APP/LVS/03.01**]), in substantial accordance with the outline.

Spoil Management

2.7.70 There will be no site wide reprofiling required, however there may be a need to flatten areas within the Order Limits. Topsoil, subsoil and spoil material is only expected to be generated from cable trenches, temporary and permanent compounds, internal access tracks, BESS Compound and Substations compounds, mitigation areas (including the Bird Mitigation Area on Solar Development Site 1), and supporting infrastructure.

2.7.71 During construction of the Cable Route Corridor, spoil will be stored temporarily within designated areas adjacent to the cable route and within the construction compounds. The spoil will be utilised to backfill the cable trenches, HDD launch and exit pits, reinstate the temporary construction compounds and any temporary access roads. Should contaminated spoil be identified during construction, this would be transported off site to a licenced waste facility for treatment.

2.7.72 Measures to manage soil are set out in the Outline Soil Resources Management Plan (oSRMP) [**EN0110012/APP/LVS/07.14**]. A detailed SRMP(s) will be produced for approval following the granting of the DCO and prior to the start of construction (this is secured by a requirement in the Draft DCO [**EN0110012/APP/LVS/03.01**]), in substantial accordance with the outline.

2.8 Operation Phase

2.8.1 The Applicant is seeking a time-limited consent with respect to the operation of the Proposed Development, which will start from the date of the final commissioning phase of the Proposed Development. The operational life of the Proposed Development will be up to 60 years.

2.8.2 During the operation phase two scenarios have been considered within the ES:

1) General operational maintenance activities; and
2) Programme of replacement activities.

General Operational Maintenance

Operational Activities

2.8.3 During general operational maintenance activity on the Solar Development Sites would be restricted principally to vegetation management, equipment maintenance and servicing, ad hoc replacement and renewal of any components that fail or reach the end of their lifespan, periodic fence inspection, vegetation management along accesses, permissive paths and landscape ecological mitigation maintenance, and monitoring to ensure the continued effective operation of the Proposed Development.

2.8.4 Along the Cable Route Corridor, operational activity will consist of routine inspections and any reactive maintenance such as where a cable has been damaged.

2.8.5 The frequency of regular maintenance visits would reasonably be expected to be limited to no more than five visits per month to any of the Solar Development Sites. Limited use of HGVs may be required for the ad-hoc replacement of components.

2.8.6 An Outline Operational Environmental Management Plan (oOEMP) [**EN0110012/APP/LVS/07.03**] has been prepared to support the DCO Application. The oOEMP sets out the general environmental principles to be followed during the operation of the Proposed Development including during general operational maintenance. The oOEMP will be used as the basis for a detailed OEMP to be prepared for approval prior to commencement of operation.

Operational staff

2.8.7 No permanent on-site staff will be required to operate the Proposed Development but there will be limited staff facilities located in the control rooms associated with the 275 kV substations. Some permanent equipment for monitoring the Solar Development Sites will be located in the Control building. Whilst this would typically be accessed remotely, it would be available for occasional physical access during routine visits. A further 15 FTE staff jobs would be created, which would not be based on site.

Operational traffic

2.8.8 During general operational maintenance, there will be a small number of daily vehicle trips, with additional staff attending when required for maintenance and cleaning activities.

2.8.9 Those arriving to undertake general operational maintenance activities would generally be expected to travel by car, appropriate 4x4 type vehicle or light van. The frequency of maintenance visits would reasonably be expected to be up to five visits per month to any of the Solar Development Sites. HGVs may be required for the ad-hoc replacement of batteries, inverters and transformers associated with the substations and the BESS.

Operational lighting

2.8.10 Regular lighting is not required within the majority of the Solar Development Sites during the operation phase of the Proposed Development and no lighting is proposed for the Cable Route Corridor.

2.8.11 All routine maintenance activities would be scheduled for daylight hours as far as is practicable, and therefore it is anticipated that focussed task specific lighting should only be required in the event of emergency works/equipment failure requiring night-time working.

2.8.12 Motion sensing security lighting would be provided within the substation compounds and within the BESS Compound to be used to maintain safe working conditions in winter months, security purposes, and maintenance activities.

2.8.13 The lighting commitments for the operation phase are set out in the oOEMP [**EN0110012/APP/LVS/07.03**], including details on lighting design, such that light spill is anticipated to be minimal.

Operational waste

2.8.14 Solid waste materials generated during Proposed Development operation and maintenance would primarily be general (household type) waste from the staff visiting site. However, there would also be a limited volume of packaging waste associated with the delivery of spare components. In accordance with legislation and guidance applicable at the time, all general and packaging type waste would be segregated prior to transport to an approved, licensed third party landfill and recycling facilities.

2.8.15 Additionally, any waste components (e.g. faulty or damaged Solar PV Panels, batteries, cables, connectors and mounting structures) would also be removed and recycled as far as practical and in accordance with legislation and guidance applicable at the time (refer to paragraph 2.9.12).

2.8.16 Paragraph 2.8.32 summarises the anticipated design life and replacement frequency for the main elements of the Proposed Development (Solar PV Panels, BESS etc.), based on other similar solar Nationally Significant Infrastructure Project (NSIP) Proposed Developments.

2.8.17 The operation of the Proposed Development will be subject to measures and procedures defined within an OEMP secured by a Requirement in the DCO. The OEMP will include for the implementation of industry standard practice and control measures for material and waste management on-site. These measures are set out in the Outline OEMP [**EN0110012/APP/LVS/07.03**] submitted with the DCO Application.

Operational water

2.8.18 During the operation phase, self-contained portable welfare units which store foul/wastewater for collection/emptying by specialist licenced contractors would be deployed on an ad hoc basis (e.g. if required by maintenance crews).

2.8.19 It is anticipated that the water supply for operational staff facilities would either be transported to the Order Limits by road from an existing nearby licenced water abstraction source and stored on site; or where mains water is available this will also be utilised. Welfare facilities will be required at the substations. Rainwater harvesting may be utilised for water supply at welfare facilities. Any wastewater will be removed via tanker to local licenced wastewater treatment works. See the Water Resources Assessment **[EN0110012/APP/LVS/07.16]** for further information.

2.8.20 The volume of stored fire water at the BESS will be maintained to ensure there is sufficient water for firefighting purposes. Details of fire water supply and storage are provided within the Outline BSMP [**EN0110012/APP/LVS/07.06**] which supports the DCO Application.

Surface water drainage

2.8.21 The detailed operational drainage design would be carried out preconstruction with the objective of ensuring that drainage of the land to the present level is maintained.

2.8.22 The design of new drainage systems would be based on Appendix 15.4: Outline Drainage Strategy (ES Volume 3) [**EN0110012/APP/LVS/06.03.15.04**]. Infrastructure would be placed at least 10 m away from watercourses, as committed to within the Design Parameters and Commitments document **[EN0110012/APP/LVS/05.06]**.

2.8.23 Management of fire water is further described in Chapter 15: Water Resources and Flood Risk (ES Volume 1) [**EN0110012/APP/LVS/06.01.15**], Appendix 15.4: Outline Drainage Strategy (ES Volume 3) [**EN0110012/APP/LVS/06.03.15.04**] and the Outline Battery Safety Management Plan **[EN0110012/APP/LVS/07.06]**.

Cleaning of panels

2.8.24 Due to the wet UK climate, Solar PV Panels are largely self-cleaning and deterioration in PV system output due to dust or dirt is generally low. The requirement for, and the frequency of, cleaning of the Solar PV Panels due to the build-up of dust and dirt varies depending upon site specific conditions. For

example, the presence of fine dust emitters such as quarries, agricultural operations (harvesting), coastal salt water, and the volume and proximity of nearby woodland can all impact the level of dust deposition. However, the main factor influencing cleaning requirements in the UK is lichen growth which again is influenced by site specific and climatic factors.

2.8.25 The requirement for cleaning due to loss of output is balanced against cost of the cleaning operation. Some sites can operate without the need to be cleaned, whereas some sites require cleaning annually. The cleaning requirements for the Proposed Development can only be accurately determined once operational and, therefore, to present a worst case for the assessments presented in this ES, a an annual cleaning cycle is assumed.

2.8.26 The Solar PV Panels would be cleaned using water only. Up to 722 m^3 would be required to clean the panels once every year. Deionised water transported to site by tanker would be used. No chemical cleaning products would be used, with stubborn dirt brushed or wiped off the panels.

Grazing

2.8.27 For the purposes of assessment and reporting of effects, as a reasonable worst case it is assumed that vegetation will be managed with machinery and there will be no grazing at the Solar PV Sites during the operation and maintenance phase.

2.8.28 However, should consent be granted, grazing by sheep will be explored, noting that there are no known landowner restrictive covenants or other reasons that would prevent such use.

Operational programme of replacement activities

Operational life

2.8.29 During the anticipated 60-year operational life of the Proposed Development, it is expected that there will be requirement for periodic replacement of some of the electrical infrastructure.

2.8.30 It is not expected that an extensive replacement of all components will be required across the entirety of the Proposed Development during one period; instead, the programme for replacement of equipment across the Proposed Development is anticipated to be staged to maintain the electrical export to the National Grid. However, in order to maximise the flexibility for how a programme of replacements may be conducted, for example to coincide with planned repairs to the grid infrastructure, each chapter has considered the relevant worst case scenario as set out below.

2.8.31 The assessments in the topic chapters confirm that, however the programme of replacements is conducted, the replacement activity would be considerably less intensive than during construction, and any environmental effects identified can be appropriately mitigated with similar measures to those identified for the construction of the Proposed Development.

2.8.32 The following assumptions have been made for the programme of replacement activities:

1) It is expected that the operational life of Solar PV Panels is 40 years or more, and that all the Solar PV Panels will be replaced once during the operational phase. The Solar PV Panels are anticipated to be replaced over a maximum 12 to 24 month period;
2) It is expected that the BESS Compound infrastructure could be replaced up to five times during the operational phase;
3) Accesses to the Solar PV Sites defined within Table 2-4 would be used. If any abnormal loads are required for the replacement of equipment, consultation will be carried out and approvals will be sought from the relevant local planning and highways authorities;
4) Components such as Solar PV Mounting Structures, cabling and the Substation are not anticipated to be replaced during the operational phase. No intrusive ground works are anticipated to replace Solar PV Panels or BESS;
5) It is anticipated that the replacement activities for the Proposed Development will create 188 Full Time Equivalent employees, with a peak month requiring up to 541 workers on-site during the replacement activities; and
6) Transformers are assumed to have a design life of 30 years, transformers may require replacement once during the lifetime of the Proposed Development although, replacement will only be carried out if required for performance or health and safety reasons.

2.8.33 This programme of replacement activities is assessed in Chapters 5 to Chapter 16 (ES Volume 1) [**EN0110012/APP/LVS/06.01**].

2.8.34 Mitigation measures associated with the programme of replacement activities are outlined within the oOEMP [**EN0110012/APP/LVS/07.03**].

2.9 Decommissioning

2.9.1 The Proposed Development is proposed to be operational for up to 60 years, after which the Proposed Development would be decommissioned. Including the likely duration of the construction and decommissioning phases, the land would be required for the Proposed Development for approximately up to 65 years in total.

2.9.2 Decommissioning may take between 12-24 months. A 24-month decommissioning period has been assumed for the purposes of a worst-case assessment in this ES, unless specifically stated otherwise. However, it is possible that decommissioning may take less time, and this will be confirmed in the final DEMP.

2.9.3 It is assumed that the process of decommissioning would involve the removal of all solar infrastructure, including the solar PV modules, and BESS and all

associated infrastructure (including On-Site Cabling) to 1.2 m bgl; to be recycled or disposed of in accordance with good practice and processes at that time. Any piles would be removed. It is expected that relatively minor decommissioning activities would require the removal of the manholes within the Cable Route Corridor to allow access to the joint bays, link boxes and fibre chambers.

2.9.4 Up to 99% of materials in a solar PV module are recyclable, with the number of solar panel recycling plants in the UK increasing. Companies which are aligned with the Waste Electrical and Electronic Equipment Recycling (WEEE) Regulations 2013 such as Recycle solar in Scunthorpe, Solar Recycling Solutions in Dartford and Waste Experts based in Huddersfield are all Approved Authorised Treatment Facilities for solar waste.

2.9.5 The Proposed Development will be decommissioned and reinstated in accordance with a Decommissioning Environmental Management Plan (DEMP). An outline DEMP (oDEMP) [**EN0110012/APP/LVS/07.04**] is included with the DCO application to secure the commitments contained within the Draft DCO [**EN0110012/APP/LVS/03.01**]. A Requirement in the DCO requires the Applicant to develop final version(s) to be produced in substantial accordance with the outline for approval, in advance of the decommissioning of the Proposed Development.

2.9.6 Upon decommissioning, the above-ground physical infrastructure at the Solar Development Sites will be removed and each Solar Development Site restored to its current use and returned to the landowner. This will include the areas of agricultural land where the agricultural resource has been maintained (and potentially improved) during operation, and the established habitats. Post-decommissioning, the landowners would choose how the land is to be used and managed, the landowner may return all of the land to arable use, although it is likely that established habitats such as hedgerows and woodland would be retained given their potential benefits to agricultural land and the wider farming estate.

2.9.7 Permissive paths would be removed during decommissioning, with the precise timing to be determined by the contractor(s) and communicated to North Yorkshire Council in accordance with the detailed DEMP approved under a requirement of the draft DCO [**EN0110012/APP/LVS/03.01**].

2.9.8 The mode of dealing with Interconnecting Cables and Grid Connection Cables during decommissioning would be dependent upon government policy and good practice at that time. Currently, the most environmentally acceptable option is considered to be leaving the cables in situ, as this avoids disturbance to overlying land and habitats and to neighbouring communities. Alternatively, the cables can be removed by opening up the ground at regular intervals and pulling the cable through to the extraction point, leaving the ducting and jointing bays in place, avoiding the need to open up the entire length of the cable route. If the cables were to be removed from within the Avoidance Areas the cable would be pulled from outside these areas. The impact assessment is based on the worst-case parameters for each technical topic.

2.9.9 Some soil profiling may be required, and the land may be contoured in agreement with the landowner and in accordance with the oDEMP [**EN110012/APP/LVS/07.04**], approximately similar to the current topography. If neded, excavations will be backfilled, using appropriate imported soil if required, otherwise with soil sourced on site, using appropriate soil management techniques as set out in oDEMP. Areas where grass does not exist because of the footprint of the previous infrastructure (e.g. the BESS and onsite substations) shall be reseeded with suitable native species, in liaison with the landowner and in accordance with the DEMP, in order to integrate the newly restored soil into agricultural use.

2.9.10 All work to the Existing National Grid Monk Fryston Substation would remain under National Grid's control and not be decommissioned by the Applicant.

2.9.11 The effects of decommissioning are expected to be similar or of a lesser magnitude, than construction effects, and are considered as such in the relevant sections of this ES. The specific method of decommissioning the Proposed Development at the end of its operational life is uncertain at present as the engineering approaches to decommissioning would evolve over the operational life of the Proposed Development. Assumptions have therefore been made where appropriate.

Waste

2.9.12 The waste generated at decommissioning would primarily be from the Solar PV Sites, including electrical components, the Solar PV Mounting Structures, and fencing. Waste would be managed in accordance with the relevant legislation and guidance at the time and in accordance with the detailed plans developed pursuant to the oDEMP [**EN110012/APP/LVS/07.04**]. Wastes would be safely and securely stored. It is anticipated waste would either be segregated and stored on-site in containers or would be stored within secure storage buildings prior to transport to an approved, licensed third party landfill and recycling facilities.

2.9.13 At this time, it is not possible to identify either the waste management routes or specific facilities that would be used, as these are liable to change over such a timescale. Other than the Proposed Development elements, the waste types generated, and effects, of decommissioning, are likely to be similar to or lesser than the construction effects.

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