



# Chapter 3: Proposed Development

## Dupplin Solar EIA Report

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## Table of Contents

<b>3. Proposed Development .....</b>	<b>3-1</b>
3.1 Introduction .....	3-1
3.2 Site Layout and Design .....	3-1
3.3 Site Access and Onsite Tracks .....	3-3
3.4 Electricity Generation and Grid Connection .....	3-4
3.5 Construction .....	3-4
3.6 Environmental Management.....	3-5
3.7 Operation and Maintenance .....	3-7
3.8 Decommissioning and Restoration .....	3-7

## Supporting Figures (EIA Report Volume 3)

- Figure 3.1 Typical Array Elevation
- Figure 3.2 Typical AUX Transformer
- Figure 3.3 Typical Transformer Station
- Figure 3.4 Typical DNO Substation
- Figure 3.5 Typical Private Substation
- Figure 3.6 Typical Communications and Spares Container
- Figure 3.7 Typical Spares Container
- Figure 3.8 Typical Trench Section
- Figure 3.9 Typical Welfare Container
- Figure 3.10 Typical Access Gate and Fence Elevation
- Figure 3.11 Typical CCTV Elevation
- Figure 3.12 Typical Access Track Cross Section



## Acronyms and Abbreviations

EIA	Environmental Impact Assessment
AC	Alternating Current
AGL	Above Ground Level
CCTV	Closed Circuit Television
CEMP	Construction Environmental Management Plan
CO <sub>2</sub>	Carbon Dioxide
CTMP	Construction Traffic Management Plan
DC	Direct Current
DMP	Development Management Procedure
DNO	Distribution Network Operator
GHG	Greenhouse Gas
ha	Hectare
HV	High Voltage
PV	Photovoltaic
PRoW	Public Right of Way
RDP	Restoration Decommissioning Plan
SPA	Special Protection Area
SPEN	Scottish Power Energy Networks
SSSI	Sites of Special Scientific Interest
UK	United Kingdom



## 3. Proposed Development

### 3.1 Introduction

3.1.1 This chapter provides a description of the Proposed Development for which consent is being sought, for the purposes of informing the identification and assessment of likely significant environmental effects. This includes the anticipated construction and operation activities connected with the Proposed Development.

### 3.2 Layout and Design

3.2.1 The final Proposed Development layout, including associated infrastructure, is illustrated in **Figure 2.3 (Chapter 2: Site Selection and Design Iterations)** and described below.

3.2.2 The Proposed Development will comprise a ground-mounted solar photovoltaic (PV) array and associated infrastructure, with a maximum generating capacity of 97.5-Megawatt peak (MWp) and an export capacity of 75 MW. The array will comprise PV modules arranged in rows, facing south at an angle of approximately 20°, with a maximum height of 2.67 m above ground level (AGL).

3.2.3 The infrastructure associated with the Proposed Development will include:

- PV module mounting frames;
- string inverters;
- field transformers;
- high voltage (HV) switchgear and control equipment;
- cabling and interconnectors;
- onsite substations and a control building;
- communications container;
- spares containers;
- access tracks;
- security fencing and CCTV; and
- temporary construction compound.

#### Solar Photovoltaic Modules and Mounting Frames

3.2.4 The Proposed Development will consist of an array of solar photovoltaic modules orientated in a southerly direction, with a maximum generating capacity of up to 97.5 MWp. The modules will stand approximately 1m Above Ground Level (AGL) at their minimum point and will be angled to approximately 20° to the horizontal and arranged in rows. Depending on the finalised angle of elevation, and the number of rows of modules, the maximum height of the modules will be up to 2.67 m AGL (refer to **Figure 3.1 Typical Array Elevation**).



- 3.2.5 Each module will be mounted upon a prefabricated alloy metal frame. The module frames will be anchored to the ground via steel piles which will be driven approximately 1.5 m-3 m below ground. The framed mounting system would be pile driven, therefore no foundations would be required.

### Inverters and Transformers

- 3.2.6 Inverters and field transformer units will be installed on Site in order to convert the Direct Current (DC) produced by the solar modules, into an Alternating Current (AC) which is compatible with the local electricity distribution network. String inverters are the preferred option for this Site layout (refer to **Chapter 2: Site Selection and Design Iterations, Figure 2.3 Site Layout**). String inverters are placed on the rear of the mounting frame so as to be less visible. The field transformers (approximately 12) will be installed in various locations across Site, to ensure voltage compatibility for export to the local electricity distribution network (refer to **Figure 3.2 Typical AUX Transformer, and Figure 3.3 Typical Transformer Station**).

### Onsite Substations, Spares and Communications Building

- 3.2.7 The Proposed Development will include one distribution network operator (DNO) substation compound, one customer (private) substation compound, one communications and spares container, and an additional larger, standalone spares container.
- 3.2.8 The DNO substation will consist of electrical infrastructure required to facilitate the export of electricity from the Proposed Development to the distribution network. The building will measure approximately 8.1 m in length by 2.6 m width, with an indicative height of 2.7 m (refer to **Figure 3.4 Typical DNO Substation**).
- 3.2.9 The customer (private) substation will measure approximately 8.1 m in length by 2.6 m width, with an indicative height of 2.7 m (refer to **Figure 3.5 Typical Customer (Private) Substation**).
- 3.2.10 One communications and spares container will provide space for operational monitoring and maintenance equipment. The communications and spares container will measure approximately 6.1 m in length by 2.4 m width, with an indicative height of 2.9 m (refer to **Figure 3.6 Communications and Spares Container**).
- 3.2.11 An additional larger standalone spares container will measure approximately 12.2 m in length by 2.4 m width, with an indicative height of 2.9 m (refer to **Figure 3.7 Typical Spares Container**).

### Onsite Cabling

- 3.2.12 Low voltage electrical cabling is required to connect the PV modules to the inverters. Alternating Current (AC) cabling from the inverters will connect to the transformers and the onsite substations via underground trenches. Refer to **Figure 3.8 Typical Trench Sections**.



### Welfare Container

- 3.2.13 The Proposed Development will include one welfare container measuring approximately 6.1 m in length by 2.4 m width, with an indicative height of 2.9 m (refer to **Figure 3.9 Typical Welfare Container**).

### Temporary Construction Compound

- 3.2.14 The Proposed Development will also include a temporary construction compound incorporating a temporary laydown and parking area, of approximately 10,000 m<sup>2</sup> (1 ha) and formed of hardcore/aggregate. This will be located near the Site entrance (refer to **Chapter 2: Site Selection and Design Iterations, Figure 2.3 Site Layout**). The compound area will be re-instated and re-seeded following the completion of construction works and removal of all temporary structures.

### Security Fencing and CCTV

- 3.2.15 Security fencing will be established around the edge of the solar array areas and associated infrastructure, to prevent unauthorised access. The fencing will stand up to 2.4 m AGL and is proposed to comprise security palisade fencing.
- 3.2.16 The entrance of the Site will comprise a 5 m wide double leaf access gate. This will stand up to 2.4 m AGL and is proposed to comprise rectangular hollow section frame and palisade gates. Elevations of the access gate and proposed security fencing are shown in **Figure 3.10**.
- 3.2.17 Closed Circuit Television (CCTV) will be deployed as a security measure. The CCTV will be mounted on galvanised steel posts each measuring approximately 4.5 m in height. The number of CCTV units installed will be minimised and will be dependent on lines of sight however indicatively around 25 cameras will be installed. The CCTV units will be installed inside and adjacent to the proposed security fencing with the exact locations to be confirmed prior to construction. They will be installed at discreet locations and will be oriented away from external landowners and dwellings. An example of the CCTV design is represented in **Figure 3.11**.

## 3.3 Site Access and Onsite Tracks

- 3.3.1 A new access would be constructed into the Site from the C411 Roman Road west of the existing Scottish Water tank (at NGR: NO NO0436820957), to the south west frontage of the Site. A drawing showing an indicative layout of this access is provided in the associated **Transport Statement (Volume 4 – Technical Appendices)**. The access has been positioned such that it would provide required visibility splays (2.4 m x 215 m, as confirmed by Perth and Kinross Council (PKC)).
- 3.3.2 The proposed access from the C411 Roman Road would be the only access used during the construction and operation of the Proposed Development. The



- additional vehicle movements during construction would be unlikely to cause any noticeable effects on users of the C411 or U47.
- 3.3.3 No construction or operational access will be provided from the U47 road (the road between the A9 and Tibbermore). Only the occasional maintenance and inspection vehicle would be generated once operational, and these would utilise the single site access at C411 Roman Road.
- 3.3.4 Each of the solar PV array sections will be accessible via the interconnected internal site access track network, approximately two access/egress points are typical in each field.
- 3.3.5 Internal access tracks will be established to allow for construction and ongoing access / maintenance to the electrical infrastructure.
- 3.3.6 The onsite tracks will have a typical 4 m running width, wider on bends and at junctions and will be surfaced with local compacted aggregates to match surrounding farm tracks. A cross section of the proposed internal access tracks is shown in **Figure 3.12**.

### **Public Access**

- 3.3.7 There are no Core Footpaths within or in proximity of the Site. The only informal path network that would be potentially utilised by locals /dog walkers would be Old Gallows Road (approximately 180 m north of the Site boundary), where several residential dwellings are located. Local and residential access at Old Gallows Road will be maintained for the duration of the construction and operation phases of the Proposed Development. Internal access tracks have been designed so that construction traffic will avoid the residential dwellings on Old Gallows Road.

## **3.4 Electricity Generation and Grid Connection**

- 3.4.1 The proposed point of connection is Burghmuir substation. The connection route would be subject to a separate application under Section 37 of the Electricity Act 1989. The Section 37 application would be progressed by the transmission network operator (Scottish and Southern Energy Networks).

## **3.5 Construction**

- 3.5.1 The construction of the Proposed Development is expected to take place over eight to twelve months and is anticipated to commence in early 2030 due to the grid availability. Construction would include the principal activities listed below and is anticipated to conclude in 2031.
- construction of Site entrance;
  - laying of new access track;
  - erection of security fencing;
  - establishing a temporary Site compound (which will include the temporary laydown and vehicle parking area);



- trenching and installation of electric cabling;
- piling and erection of the module mounting frames;
- installation of transformers, inverters and switchgears; and
- construction of the substation(s), spares and control buildings.

3.5.2 Normal construction hours will be between 07:00 and 19:00 Monday to Friday and 09:00 and 13:00 on Saturdays. These times have been chosen to minimise disturbance to local residents. It must, however, be noted that out of necessity due to weather conditions and health and safety requirements, some generally quiet activities may occur outside the specified hours stated. Any construction outwith these hours will be in line with agreed noise limits and advance warning of any works outwith the agreed working hours will be provided to PKC and local residents.

3.5.3 During construction, temporary materials storage will be located within the construction compound and set-down area. The temporary construction compound will comprise a small Portakabin and welfare facilities. The construction compound will not require any hardstanding.

## 3.6 Environmental Management

### Construction

3.6.1 It is considered that the construction phase of the Proposed Development will not give rise to a significant number of daily additional vehicle trips, c.92 vehicle movements per day on average during the busiest month (month 5). As such, the impact of traffic levels on the road network surrounding the Proposed Development are unlikely to cause any noticeable effects.

3.6.2 The access route has limited sensitive receptors, reducing any potential transportation impacts experienced during the construction phase.

3.6.3 A Transport Statement has been undertaken, supported by a Transport Screening Report to establish the scope of study parameters, demonstrate consultation with local road officers and estimation of construction loads/trip numbers to assess the potential impact of construction traffic upon the local road network.

3.6.4 It is expected that the construction works would last around eight to twelve months. A Construction Environmental Management Plan (CEMP) will be prepared and agreed with PKC prior to the commencement of construction activity.

3.6.5 The CEMP will describe how the Applicant will ensure suitable management of environmental issues during construction of the Proposed Development, including but not limited to:

- noise;
- dust and air pollution;



- water quality and pollution prevention;
- surface water drainage and ground water; and
- ecology (including habitats and species protection measures, and biodiversity enhancements).

3.6.6 The CEMP will set out:

- details of the all the construction-related environmental mitigation which is described within this EIA Report, and how the Applicant will implement this mitigation;
- details of the role of the Ecological Clerk of Works (ECoW) overseeing the construction stage;
- details on how the Applicant will abide by the local and national legislative requirements;
- details on how the Applicant will implement and monitor construction best practice techniques e.g. the control of noise, dust and pollution; and
- details on how the Applicant will liaise with the public and local landowners and how they will respond to any queries and/or complaints.

### **Pollution Prevention and Health and Safety**

3.6.7 Prior to commencement of construction activities, a pollution prevention strategy, contained within the CEMP, will be agreed with PKC and SEPA to ensure that appropriate measures are put in place to protect watercourses and the surrounding environment.

3.6.8 As with any development, during the construction stage there is the potential for threats to the quality of the water environment in waterbodies, watercourses and local ditches. These mostly arise from poor Site practice so careful attention will be paid to the appropriate guidance and policies to reduce the potential for these to occur.

3.6.9 Any fuel or oil held on-Site will only be of an amount sufficient for the plant required. This will be stored in a bunded area to prevent pollution in the event of a spillage. There will be no long-term on-Site storage of lubricants or petrochemical products.

3.6.10 High standards of health and safety will be established and maintained in line with HSE requirements (ie following advice on utilities stand-off construction buffers etc). At all times, all activities will be undertaken in a manner compliant with applicable health and safety legislation and with relevant good practice, as defined under applicable statutory approved codes of practice and guidance.

### **Traffic and Transportation**

3.6.11 Traffic associated with the construction and maintenance of the Proposed Development falls into the category of Construction/Maintenance Loads which do not require any special escort or permissions and are only influenced by normal traffic regulations.



## Pre-Construction Surveys

- 3.6.12 Pre-construction surveys will be undertaken to update the ecological and ornithological baseline and to perform detailed geotechnical ground surveys (only for the impermeable substation compound / swale areas). Further details of these are provided in the relevant technical chapters.

## 3.7 Operation and Maintenance

- 3.7.1 Once operational, the solar array will require scheduled and occasional unscheduled maintenance of the solar modules and associated infrastructure. The scheduled maintenance is expected to consist of a monthly routine Site inspection.
- 3.7.2 The land around the panels will remain as grass cover (forage crop) seeded with wildflower mix and will be managed for grazing (sheep will be rotated by farmer). Further details on this are included in **Chapter 5: Landscape and Visual**; and outlined in the **Landscape Mitigation Plan**.
- 3.7.3 Access to local residential areas along Old Gallows Road to the north of the Site will remain unaffected and maintained by the Applicant throughout the operational phase of the Proposed Development.

## 3.8 Decommissioning and Restoration

- 3.8.1 The Applicant is applying for consent to operate the solar development for 40 years. The Applicant is committed to decommissioning and restoring the Site to its previous agricultural use. In the event that a decision was to be made that the Site could be re-powered/re-fitted, then a new consenting process, including supporting statement as to the potential environmental effects, would be required.
- 3.8.2 Decommissioning is a relatively straightforward process and similar to the construction process, with the majority of structures and equipment designed to be disassembled and removed in a straightforward manner (with inverters etc. being containerised and simply able to be detached from the piles they are placed on and the solar arrays disassembled, and piles pulled up).
- 3.8.3 The following will be required for decommissioning and removing the Proposed Development at the end of its operational lifespan:
- the substations, transformers, panels and frames will be dismantled and removed via the same access as will be used for construction;
  - as much material as possible will be directed to recycling or salvage/re-use, likely to be dependent on demand, market conditions and recycling facilities available at the time; and
  - the area will be restored to agricultural use by infilling structural holes, repairing cable trenches, and landscaping/re-seeding.



- 3.8.4 The limited physical infrastructure that is required on the ground area (around 5%) for a solar farm allows for quick and easy restoration of land back to its existing agricultural land use.
- 3.8.5 The Applicant is committed to providing a detailed decommissioning and restoration plan, costed by an independent advisor, to be agreed with PKC prior to commencement of construction. This could be secured through an appropriately worded planning condition.

#### **Cumulative Developments**

- 3.8.6 **Chapter 5: Landscape and Visual** considered all planned and consented developments within 4km of the Proposed Development. A single relevant pre-application pertaining to a 49 MW solar and BESS with associated infrastructure at Kinnon Park, Methven (24/01188/FLM) was identified and considered in the LVIA as a potential cumulative consideration.
- 3.8.7 The **Landscape and Visual Impact Assessment (LVIA)** in **Chapter 5** of the EIA Report found that the potential cumulative effects of the Proposed Development in combination with the proposed Kinnon Park solar development would not be significant due to their spatial separation, and the effects of intervening landform.
- 3.8.8 Where there is sufficient information, other potential cumulative effects have been considered in the EIA and in relevant technical assessments (ie refer to **shadow Habitats Regulations Appraisal (sHRA)– Volume 4 Technical Appendices**).

