Chapter 3:
Proposed Development Description

West Springfield Solar EIA Report

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Basis of Report

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Acronyms and Abbreviations

EIA	Environmental Impact Assessment
AC	Alternating Current
AGL	Above Ground Level
BESS	Battery Energy Storage System
CCTV	Closed Circuit Television
CEMP	Construction Environmental Management Plan
CO_2	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
PCS	Power Conversion System
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

3.0 Proposed Development Description

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 Site Layout and Design

3.2.1 The final Proposed Development Site layout, including associated infrastructure, is illustrated in **Figure 2.1 (Chapter 2: Site Description and Design Iteration)** and described below.

3.2.2 The Proposed Development will comprise of a ground-mounted solar photovoltaic (PV) array and associated infrastructure with an installed capacity of 49.9MW and a build-out of 65 Megawatt peak (MWp). The PV array will comprise of PV modules arranged in rows with a maximum height of 2.67m above ground level (AGL).

3.2.3 The Proposed Development also includes a Battery Energy Storage System (BESS) with a capacity of 35MW. The BESS will store excess energy generated by the solar PV array and release it during periods of high demand or low generation.

3.2.4 The infrastructure associated with the Proposed Development will include:

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

3.2.4.1 Solar Photovoltaic Modules and Mounting Frames

3.2.5 The Proposed Development will consist of an array of solar photovoltaic modules orientated in a southerly direction, with a build out capacity of up to 65MWp. The modules will stand approximately 1m Above Ground Level (AGL) at their minimum point and will be angled to 20° to the horizontal and arranged in rows. Depending on the finalised angle of elevation, and the number of rows of modules stacked, the maximum height of the modules will be up to 2.67m AGL (refer to **Figure 3.1 Typical Array Elevation).**

3.2.6 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 1.5m-3m below ground. The framed mounting system would be pile driven, therefore no foundations would be required.

3.2.6.1 Inverters and Transformers

3.2.7 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 Description and Design**, **Figure 2.1 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 each be installed in various field 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).**

3.2.7.1 Battery Energy Storage System (BESS) Compound

3.2.8 There will be approximately 24 Battery Energy Storage System (BESS) containers in the Proposed Development measuring approximately 8.3m in length by 3.1m in width (refer to **Figure 3.4 Typical BESS Container**)**,** with indicative height of 2.6m (including platform height). The six associated Power Conversion System (PCS) stations will be located adjacent to the BESS containers, to allow the batteries to switch between inverter and charger modes. They measure approximately 9.2m in length by 5.4m width with an indicative height of 2.3m (refer to **Figure 3.5 Typical PCS Station**). The BESS and PCS units will be located in a compound within the north land parcel – in field 8 (refer to **Chapter 2: Site Description and Design**, **Figure 2.1 Site Layout**).

3.2.9 The BESS compound would be situated in a part of the Site with negligible flood risk.

3.2.9.1 Onsite Substations, Spares and Communications Building.

3.2.10 The Proposed Development will include one distribution network operator (DNO) substation compound, two customer (private) substation compounds, one communications container, one standard spares container, and an additional larger, standalone spares container.

3.2.11 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 8.1m in length by 2.6m width, with an indicative height of 2.7m (refer to **Figure 3.6 Typical DNO Substation**).

3.2.12 The two customer (private) substations will each measure approximately 8.1m in length by 2.6m width, with an indicative height of 2.7 m (refer to **Figure 3.7 Typical Customer (Private) Substation(s)**).

3.2.13 One communications container and two spares containers (including one larger additional container) provide space for operational monitoring and maintenance equipment. The communications container will measure approximately 3m in length by 2.4m width, with an indicative height of 2.9m (refer to **Figure 3.8 Communications and Spares Containers).**

3.2.14 The additional larger standalone spares container will measure approximately 12.2m in length by 2.4m width, with an indicative height of 2.9m (refer to **Figure 3.9 Typical Spare Container**).

3.2.14.1 Onsite Cabling

3.2.15 Low voltage electrical cabling is required to connect the PV modules to the inverter. Alternating Current (AC) cabling from the inverters will connect to the transformers and the onsite substations via underground trenches. Refer to **Figure 3.10 Typical Trench Sections.**

3.2.15.1 Welfare Container

3.2.16 The Proposed Development will include two welfare containers measuring approximately 6.1m in length by 2.4m width, with an indicative height of 2.9m (refer to **Figure 3.11 Typical Welfare Container**).

3.2.16.1 Firewater Tanks

3.2.17 Two fire water tanks will be served by an associated pump house. The water tanks will each be 115,000L in volume (230,000L total) with indicative height of 3m and diameter 7m (refer to **Figure 3.12 Typical Water Tanks**).

3.2.17.1 Temporary Construction Compound

3.2.18 The Proposed Development will also include a temporary construction compound incorporating a temporary laydown and parking area, of approximately 10,000m² (1ha) and formed of hardcore/aggregate. This will be located near the Site entrance of the proposed BESS area (refer to **Chapter 2: Site Description and Design**, **Figure 2.1 Site Layout**). The compound area will be re-instated and re-seeded following the completion of construction works and removal of all temporary structures.

3.2.18.1 Security Fencing and CCTV

3.2.19 Security fencing will be established around the edge of the solar array areas, also incorporating the BESS compound and associated infrastructure, to prevent unauthorised access. The fencing will stand up to 2.4m AGL and is proposed to comprise of security palisade fencing.

3.2.20 The entrance of the Site will comprise a 5m wide double leaf access gate. This will stand up to 2.4m AGL and is proposed to comprise rectangular hollow section frame and palisade gates. An elevation of the access gate is shown in **Figure 3.13.**

3.2.21 Closed Circuit Television (CCTV) will be deployed as a security measure. The CCTV will be mounted on galvanised steel posts each measuring approximately 4.5m in height. An example of the security fencing and CCTV is represented in **Figure 3.14.** 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.

3.3 Site Access and Onsite Tracks

3.3.1 A new access would be constructed onto the C13 Main Street at the northeastern corner of the Proposed Development. A drawing showing an indicative layout of this access is provided in the associated Transport Statement (Volume 4). The access has been positioned such that it would not interfere with access to the section of Core Path R159 to the east of the C13 Main Street.

3.3.2 The proposed access from the C13 Main Street would be the only access used during the construction of the Proposed Development. A suitable crossing of the Rankeilour Burn (which bisects the Site of the Proposed Development on an approximate north – south route) would be provided during construction allowing vehicles to access all parts of the Proposed Development from internal tracks accessed from the proposed access onto the C13 Main Street.

3.3.3 The access from the C13 Main Street would also be the main access when the Proposed Development was operational, though operational access would also be provided from the U105 at the existing access on the U105 to Peterhead Farmhouse. No alterations are proposed to this existing access.

3.3.4 In addition to the operational accesses from the C13 Main Street and U105, two additional emergency-only accesses would be provided. One would be provided from the C13 Main Street, using an existing field access at the southeastern corner of the Proposed Development's frontage onto the C13 Main Street. The second would be provided from the existing private access to Rankeilour Mains.

3.3.5 Gates would prohibit access to the Proposed Development via these additional emergency-only accesses during non-emergency operation.

3.3.6 A suitable crossing of the Rankeilour Burn would also be provided during operation. This crossing would allow operational vehicles to access all parts of the Proposed Development from the accesses onto the C13 Main Street and the U105 and allow emergency vehicles to access all parts of the Proposed Development.

3.3.7 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.

3.3.8 Internal access tracks will be established to allow for construction and ongoing access / maintenance to the electrical infrastructure on Site.

3.3.9 The onsite tracks will have a typical 4m 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 3.15**.

3.3.9.1 Public Access

3.3.10 Core Footpath P166/01 (Springfield to Sweetholm) crosses the Site from east to west, along the south boundary, and north of The Moor. An informal path network utilised by locals and dog walkers, routes through the woodlands at The Moor and extends to the north and west of field 8. A 5m buffer has been implemented around the paths and local access will be

maintained for the duration of the operation of the Proposed Development. Internal access tracks have been designed so that construction traffic will avoid routing near the paths.

3.4 Electricity Generation and Grid Connection

3.4.1 The proposed point of connection is Cupar substation as per the accepted grid connection offer from Scottish Power Electricity Networks (SPEN). The grid connection is not part of the Section 36 application and will be applied for separately at a later date.

3.5 Construction

3.5.1 The construction of the Proposed Development is expected to take place over eight to twelve months and anticipated to commence in early 2028due to the grid availability. Construction would include the principal activities listed below and is anticipated to conclude in 2029.

- laying of new access track;
- construction of Site entrance;
- 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 Fife Council 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.

3.5.4 The substation compound will be a gravelled area with component parts situated on concrete 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.97 vehicle trips per day on average. As

such, the impact of traffic levels on the road network surrounding the Proposed Development will be negligible.

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, and will include 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 9-12 months. A Construction Environmental Management Plan (CEMP) will be prepared and agreed with Fife Council prior to the commencement of construction activity.

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

- noise;
- dust and air pollution;
- water quality and pollution prevention;
- surface water drainage and ground water;
- ecology (including habitats and species protection measures, and biodiversity enhancements);
- Pollution Prevention Plan;
- Site operations (including maintenance of the construction compounds, working hours and safety of the public).

3.6.6 The Applicant will provide the following for the above environmental issues:

- 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 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 & Safety

3.6.7 Prior to commencement of construction activities, a pollution prevention strategy, contained within the CEMP, will be agreed with Fife Council 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. 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.

3.6.12 Construction/Maintenance Loads do not require any special escort or permissions and are only influenced by normal traffic regulations.

Pre-Construction Survey

3.6.13 Pre-construction surveys will be undertaken to update the ecological and ornithological baseline and to perform detailed geotechnical ground surveys, 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 Once the BESS is operational, it will require minimal maintenance. Maintenance is expected to consist mostly of routine Site inspections by technicians, as well as unscheduled visits when required.

3.7.3 The land around the panels will remain as grass cover (forage crop) seeded with wildflower mix and will be managed for grazing (potentially sheep). Further details on this are included in **Chapter 5: Landscape and Visual;** and outlined in the **Landscape Mitigation Plan.** Access to the local track and Core Path to the centre and south of the Site will be 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 and BESS 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 Fife Council prior to commencement of construction. This could be secured through an appropriately worded planning condition.

3.8.5.1 Cumulative Developments

3.8.6 **Chapter 5: Landscape and Visual** considered all planned and consented relevant developments within 5km of the Proposed Development. A single relevant pre-application pertaining to a 29.9MW solar array with associated infrastructure at Over-Rankeilour Farm, Cupar (24/02459/PAN) was identified and considered in the LVIA. The low-lying nature of both developments and the intervening distance (2.8km) will not allow for the developments to be seen in combined visibility. It was therefore confirmed that further cumulative assessment is not required.

3.8.7 Where there is sufficient information, other potential cumulative effects have been considered in the EIA and in relevant technical assessments.