Chapter 2: Site Selection and Design Iteration

West Springfield Solar EIA Report

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Basis of Report

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Acronyms and Abbreviations

BESS	Battery Energy Storage System
EIA	Environmental Impact Assessment
FC	Fife Council
GWDTE	Ground Water Dependent Terrestrial Ecosystems
NGR	National Grid Reference
PV	Photovoltaic
SSSI	Site of Special Scientific Interest
SuDS	Sustainable Drainage System

2.0 Site Selection and Design Iteration

2.1 Introduction

2.1.1 This chapter outlines the process undertaken in selecting the Site as a potential and suitable location for a solar farm and BESS, provides a description of the Site and surrounding area, and discusses the design evolution process.

2.1.2 The principles of the EIA process, including that site selection and project design should be an iterative constraint-led process, have been followed. This has ensured that potential adverse impacts on the environment, as a result of the Proposed Development, have been avoided or minimised as far as reasonably possible through the design process.

2.1.3 This chapter draws on issues considered in more detail in the relevant technical chapters (**Chapter 5: Landscape and Visual**, **Chapter 6: Ecology and Biodiversity, and Chapter 7: Cultural Heritage and Archaeology**), and in the supporting technical assessments (provided as appendices to this EIA Report. This chapter does not pre-empt the conclusions of the technical assessments but explains how potential environmental effects have informed the design of the Proposed Development.

2.1.4 The design of the Proposed Development is described in **Chapter 3: Proposed Development Description** and is shown on **Figure 2.1.**

2.2 The Site and Surrounds

2.2.1 The Site, centred on National Grid Reference (NGR) NO 33114 11547, is located at Rankeilour Estate, approximately 2.7km south west of Cupar, within the Fife Council (FC) administrative area. The Site comprises of twelve distinct agricultural fields enveloped by mature woodland to the north, south and west. The total area of the Site is 101.3ha. (refer to **Figure 3.1**)

2.2.2 The existing land use is predominantly agricultural (arable) interspersed with woodland blocks. The Rankeilour Burn transects the Site from north to south but is mainly outside the Site boundary.

2.2.3 There are no residential properties on the Site. The closest residences within the land ownership are Rankeilour House (30m centre and west of the Site boundary) and Rankeilour Steadings (Stable Cottage) which are located centre and north of the Site boundary (100m). Other residential properties outwith the landownership but in proximity are Peterhead (c.25m), East Lodge (c.100m) and at Main Street (c.20m), Springfield. The settlement of Springfield is located approximately 0.4km west of the Site

2.2.4 The Site does not overlap with any statutory nature conservation designations. The closest is Waltonhill and Cradle Den Site of Special Scientific Interest (SSSI) approximately 3.4km to the south east.

2.2.5 The Site and surrounding area contain several prehistoric assets, including a ring ditch within the Site and various burial and domestic remains nearby. No Romano-British assets are within the Site, and medieval assets are limited but include references to the village of Pitlessie and nearby estates. Numerous post-medieval assets are associated with nearby estates, including

Nether Rankeilour and Over Rankeilour, reflecting agricultural and domestic use. Modern assets primarily relate to World War I and II, including war memorials and defensive structures. These are listed and described in **Chapter 7: Cultural Heritage and Archaeology**.

2.3 Site Selection and Consideration of Alternatives

2.3.1 Schedule 4, paragraph 2 of the EIA Regulations requires that an EIA Report should include: "*a description of the reasonable alternatives (for example in terms of development design, technology, location, size and scale) studied by the developer, which are relevant to the proposed project and its specific characteristics, and an indication of the main reasons for selecting the chosen option, including a comparison of the environmental effects*."

2.3.2 The main alternatives including design, component specification, location, size and scale have been considered for the Site.

2.3.3 The Site was identified as an area which would be appropriate for solar development through initial feasibility work which considered the following key issues:

- cumulative developments (i.e. the proximity of the Site to other solar farm developments and the potential for significant cumulative effects arising between them);
- grid connection (i.e. within 10 km of a substation with sufficient capacity to export the power generated);
- environmental designations (i.e. international and national designations for ecology, landscape and cultural heritage); and
- yield (i.e. sufficient irradiation).

2.3.4 This process determined that the Site would be appropriate for a solar development, with no inter-visible planned or consented solar developments within a 2km of the Proposed Development; sufficient and viable grid availability in the area; proximity to a connection point; and with no environmental designations within the Site boundary that would constrain development.

2.3.5 Having determined that the Site would be appropriate for a solar farm development based on the above factors, further detailed feasibility work was undertaken, which included:

- consideration of topography (i.e. the availability of flat and south facing fields which offer a higher level of energy production, due to lower levels of overshading meaning that panels can be placed in closer proximity);
- consideration of land use - the Site is predominantly lower class prime agricultural land (Grade 3.1) with extents of Grade 2, however there is considered to be an abundance of prime agricultural land nearby (Grades 2 and 3.1);
- identification of the closest residential receptors and consideration of potential residential visual amenity impacts;
- determining an indicative layout that could be supported by the Site; and
- positive pre-application discussions with FC and the local community.

2.3.6 These steps identified the Site as one with good potential for solar and BESS development and with minimal environmental constraints.

2.4 Design Principles

2.4.1 In an EIA, the identification of constraints should continue throughout the design process as more detailed surveys reveal additional constraints to development. In this way, the findings of the technical and environmental studies can be used to inform the design of a development and hence achieve a 'best fit' within the environment of the Site.

2.4.2 The Applicant adopted the following principles during the design iteration process where possible to ensure the final design of the Proposed Development was the most suitable for the Site:

- avoid designated and protected sites;
- sensitively site to avoid or minimise setting effects on heritage assets;
- avoid or minimise impacts on sensitive identified ecological habitats and species;
- minimise impacts in respect of noise and the visual amenity of residential properties;
- minimise traffic and transport impacts;
- consider topography in terms of suitability for siting panels;
- avoid areas of high-risk flooding; and
- maximise the potential renewable electricity generation.

2.5 Iterative Scheme Design

2.5.1 The initial Proposed Development layout was designed to maximise renewable energy yield and focus on south facing and flat land. It also included a buffer from the residential dwellings to the east of the Site boundary.

2.5.2 Layout changes were subsequently made following the completion of baseline studies, surveys and consultations. The aim was to continue maximising renewable energy yield while avoiding environmental and technical constraints, ensuring no significant adverse environmental effects as well as taking into consideration views of local residents. Care was also taken to maintain existing field boundaries, allowing breaks in panel rows for maintenance.

2.5.3 The following summarises the design changes that have been made during this iterative process:

- Early design iterations excluded areas of the Site (refer to **Figure 2.2 Layout 1: Concept Layout**):
  - area in the centre of the Site excluded from the Proposed Development in order to avoid the Rankeilour Burn;
  - field in the north west of the Site excluded due limited vehicular accessibility;
  - area in the south of the Site excluded due to being outwith land ownership, and also in close proximity to a core path and other informal rights of way; and

  - area adjacent to the north of the Site excluded due to proximity of residential properties.
- development buffers (i.e. no-build zones) were added in order to minimise potential disturbance to roosting bats (refer to **Chapter 6 – Ecology and Biodiversity)** and other habitats of ecological value such as plantation forestry, broadleaved woodland and Ground Water Dependent Terrestrial Ecosystems (GWDTE);
- development buffer around properties in Springfield to ensure appropriate stand-off distance from the proposed BESS, particularly with regard to potential noise impacts;
- a 15m development buffer from trees and pylons to prevent overshading of panels;
- development free corridor from Rankeilour House in the north to woodland in the south of the Site to provide a commuting corridor and habitat connectivity for bats; and
- development free corridors in proximity to Core Path P166/01[1], informal local tracks and Rights of Way along the south boundary and south east fields, and along the north boundary access road to maintain amenity for walkers.

2.5.4 These design iterations have been made in line with the design principles set out in Section 2.4.2.

2.5.5 There have been three principal iterations in the design of the Proposed Development. These iterations, referred to as Layouts 1 to 3, are summarised below.

Layout 1: Concept Layout

2.5.6 Layout 1: Concept Layout (refer to **Figure 2.2**) was informed by preliminary desktop environmental studies, and was the layout presented at initial community consultation events in 2022. This layout represents maximum coverage of the Site with solar photovoltaic (PV) panels based on maximising generating capacity of the Site whilst taking consideration of known Site constraints.

[1] https://fifeonline-maps.maps.arcgis.com/apps/webappviewer/index.html?id=f6186ea47efc46cd911a4d5314823900

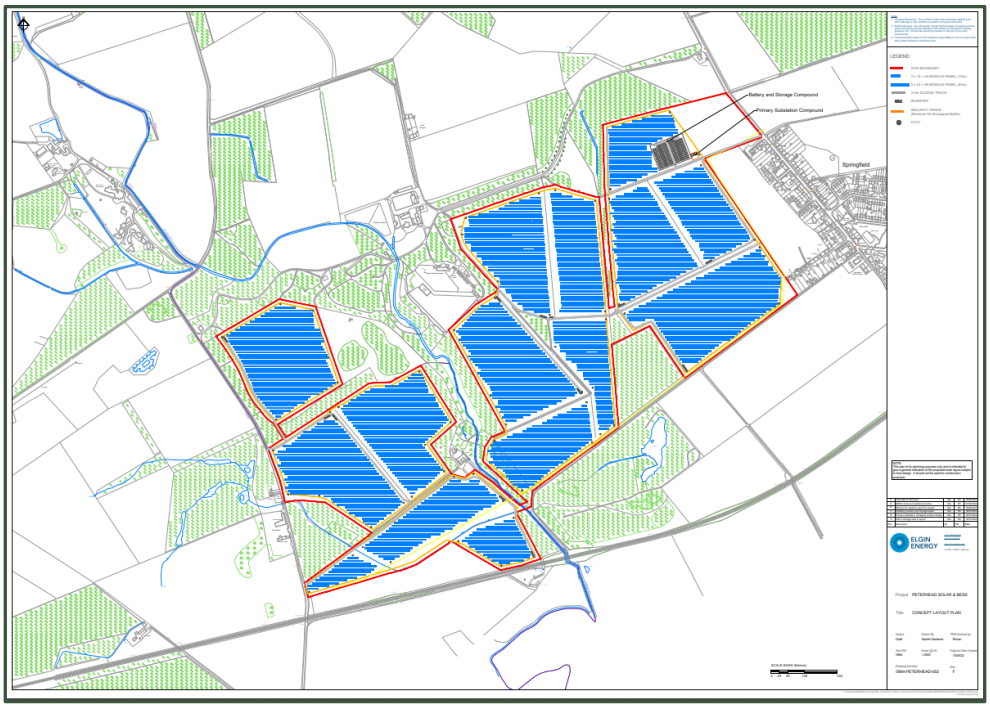

Figure 2.2 – Layout 1: Concept Layout (Elgin Energy, September 2022)

Layout 2: Preliminary Layout

2.5.7 Layout 2: Preliminary Layout (refer to **Figure 2.3**) was informed by baseline survey work, pre-application consultation with FC, and feedback from community engagement, including a public exhibition. This layout reflects changes to the red line boundary with increased setback in the east from residential properties at Springfield, to reduce visibility of the Proposed Development from this area. Offset of the solar PV modules from the Site perimeter was increased to allow for sufficient space for maintenance access and hedgerow planting. The BESS compound was relocated further west to a well-screened land parcel, away from the east boundary to minimise visibility, and increase distance from potential noise sensitive receptors in Springfield.

Figure 2.3 - Layout 2: Preliminary Layout (SLR Consulting, February 2025)

Layout 3 (Final Layout)

2.5.8 The final layout (refer to **Figure 2.1**) is the layout which is subject to the application for Section 36 consent. Layout 3 was refined based on consolidated constraints from further Site surveys and baseline assessments including:

- Preliminary Ecological Appraisal (i.e. with a focus on bats and other protected species including badger, red squirrel and buzzard);
- hydraulic modelling of Rankeilour Burn (i.e. mapped worst case flood risk extents);
- archaeological protection buffers;
- potentially buried (unknown) pre-historic assets;
- noise monitoring results;
- Site access requirements (i.e. proximity to core path, visibility splay extents);
- viewshed of Zone of Theoretical Visibility; and
- proposed planting and vegetative screening.

2.6 References

Scottish Government (2017) The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017. Available at: https://www.legislation.gov.uk/ssi/2017/102/contents/made.